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BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

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JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

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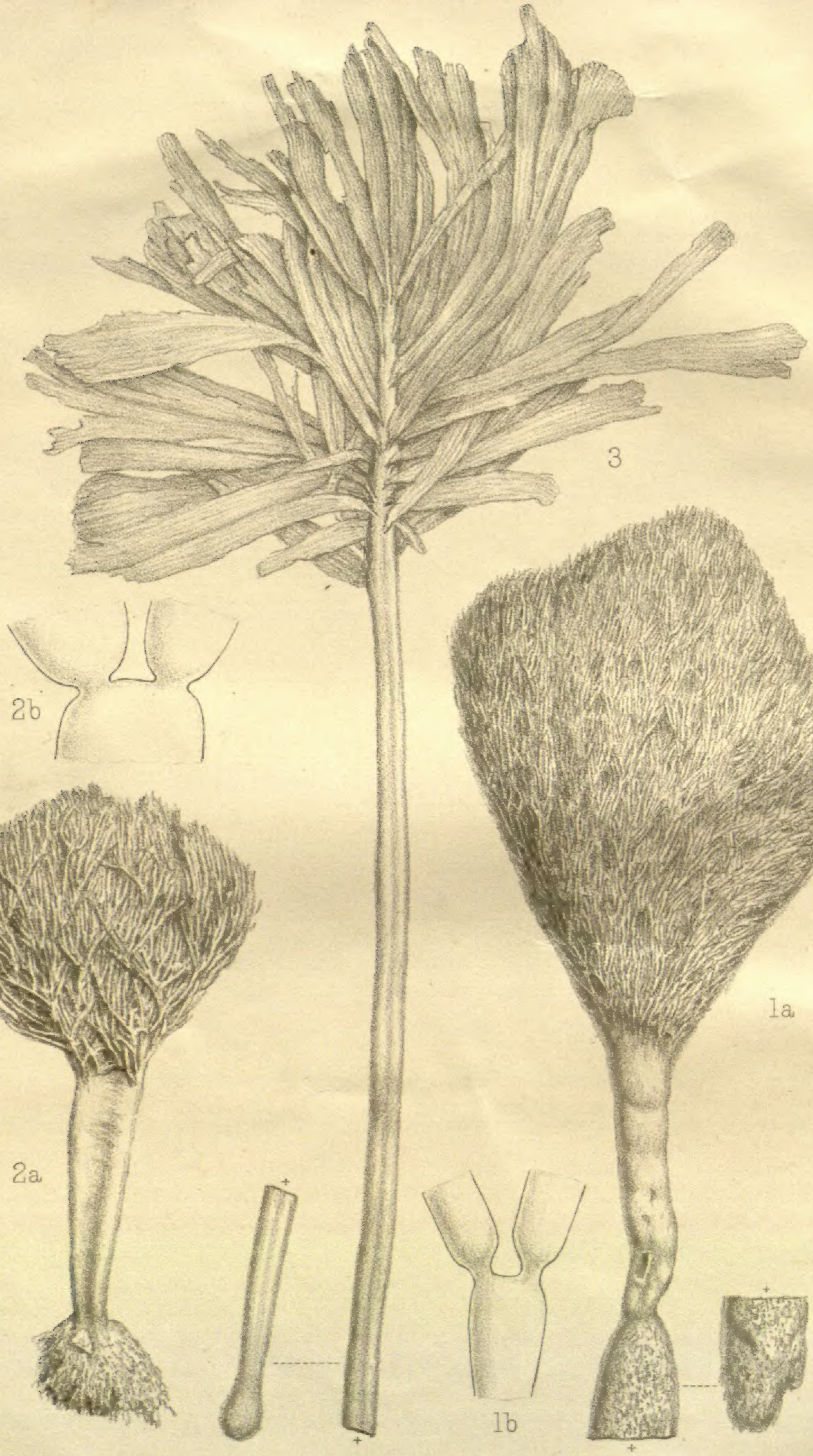

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Penicillus and Rhipocephalus.

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

NOTES ON PENICILLUS AND RHIPOCEPHALUS.

By A. and E. S. Gepp.

(Plate 468.)

Penicillus is one of the genera of calcified algæ which were formerly regarded as zoophytes under the name of *Corallina*. It received the name *Penicillus* from Lamarck in 1813. Though dubbed *Nesæa* by Lamouroux in the preceding year, it had no right to that name; for *Nesæa* was already, and still is, in use for a genus of *Lythrarieæ*. Decaisne in 1842 made the first satisfactory attempt to put the genus into systematic order, but retained in it the two species which Kützing in 1843 separated off under the name *Rhipocephalus*.

The West Indian region is the headquarters for most of the species, and parts of it have recently been carefully explored by Mr. Marshall A. Howe, who has published a short report (in Journ. New York Bot. Garden, v. 1904, pp. 164–166) of his visit to the South of Florida and the Bahamas, in which he says that *Penicillus* and *Rhipocephalus* are especially well represented in the Bahama Islands. He has been so kind as to supply us with a set of specimens gathered by him. These comprised four forms of *Penicillus*—*viz.* the well-known *P. capitatus* and *P. dumetosus*, with a new species and a new variety. These latter he allows us to describe, as we are working at a revision of the genus. The diagnosis of the new species is as follows:—

P. pyriformis, sp. n. (fig. 1). Stipite brevi (10–30 mm.), crasso (6–7 mm.), parum compresso, in capitulum vix penetrante, superficie inæquali; capitulo pyriformi, 5–7 cm. longo, 3–4·5 cm. lato, denso, post exsiccationem glaucoviridi; filamentis capituli calce indutis, ascendentibus, congestis, intertextis, 150–200 μ crassis.

Hab. Bahama Islands, Bemini Harbor, in 1–8 dm. of water, low tide, with *P. capitatus*, *Rhipocephalus Phœnix*, &c., April, 1904, *M. A. Howe*! (No. 3236), in Herb. Mus. Brit. Bermuda, Eli's Harbor, Somerset, *M. A. Howe*! (No. 244). Florida, Key West, *Hooper*! in Farlow Anderson & Eaton's Alg. Exsicc. Amer. Bor. No. 43 pro parte, in Mus. Bot. Copenhagen.

It differs from *P. capitatus*, as was pointed out to us by Mr. Howe, by the usually pear-shaped capitulum, the interlacing filaments, and the stalk barely penetrating into the head. It is, moreover, a heavier plant, owing to the amount of sand entangled among the filaments of the capitulum. The stalk may be sometimes a little branched, and the capitulum infundibuliform; the filaments are sometimes globosely constricted above or below the dichotomy.

Mr. Howe's other novelty is in our opinion no more than a slender variety of a little-known existing species—*P. Lamourouxii* Decaisne. The type of this species came from the Bahamas, and is preserved in Herb. Lamouroux at Caen under the name *Nesea dumetosa*. Since Decaisne published his description of it in 1842 (Ann. Sci. Nat. 2de Sér. tom. xviii. p. 109), no one has added fresh records of the true plant. Kützing's figure of "*Lamourouxii*" (Tab. Phyc. viii. t. 29, fig. 1) represents a plant of *P. dumetosus*; on the other hand, Crouan's specimens of "*Lamourouxii*" issued by Mazé et Schramm in their *Algues de la Guadeloupe*, Nos. 488 and 779 are *P. capitatus*. The typical form of the species is undoubtedly rare. In the several collections which we have examined we have found only three gatherings—*viz.* in Herb. Lamouroux, Herb. Chauvin, and Herb. F. S. Collins, in which last there is a single crushed specimen under the name *P. dumetosus* from Annato Bay, Jamaica, collected by Mrs. Pease and Miss Butler. In Herb. Lamouroux there are some nine specimens of *P. Lamourouxii* from the Bahamas; and in Herb. Chauvin there are six, unlocalized, but probably from the same locality, Chauvin having been the friend and successor of Lamouroux. And here we would take the opportunity of expressing our warm thanks to Prof. Lignier, the present distinguished occupant of Lamouroux's chair, for his kind courtesy in lending us the valuable collections of Lamouroux and Chauvin for examination.

Our new variety is more commonly distributed than the type, and has been issued in some published sets as *P. capitatus*. Its diagnosis is as follows:—

P. Lamourouxii Decaisne, var. GRACILIS, var. nov. (fig. 2). Stipite 30–40 mm. longo, c. 5 mm. crasso, sæpius compresso, rare subcanaliculato, leptodermo (hinc molli), lævi, vix in capitulum penetrante; capitulo globoso, 30–40 mm. diam.; filamentis capituli duplo magis copiosis quam in planta typica et gracilioribus (300–400 μ crassis), ascendentibus, calce valde indutis.

Hab. Florida, Key West, in 3–10 dm. of water at low tide, *M. A. Howe*! (No. 1412*b*). Bahamas, Bemini Harbor, *M. A. Howe*! (No. 3238). St. Croix, *Herb. Börgesen*!

This variety is an intermediate between *P. Lamourouxii* and *P. capitatus*. In habit it closely resembles the former, as also in its thin-walled, compressible, usually flattened stem, which penetrates but a very short way into the capitulum (less than a quarter of the length of the capitulum). It differs from typical *P. Lamourouxii* in having more abundant and more slender capitulum-filaments, those of *P. Lamourouxii* being 400-500 μ in diam., while those of var. *gracilis* measure 300–400 μ.

P. capitatus differs in having still more slender filaments, normally measuring 100–200 μ in diam., and not exceeding 300 μ; its stem, moreover, is thinner, terete, rigid, often much longer, and penetrates into the middle of the capitulum or beyond.

As regards figures 1 *b* and 2 *b*, which represent portions of capitulum-filaments branching dichotomously, each branch exhibiting the characteristic basal constriction, it should be pointed out that neither in *Penicillus* nor in *Rhipocephalus* is there ever at these constrictions or elsewhere any transverse septum. The plant is unicellular throughout. On this point Harvey was in error. In writing of *P. dumetosus* in *Nereis Boreali-Americana*, iii. (1857), p. 44, he says: "As long as these longitudinal filaments cohere into a stipe they are unicellular; but when they become free at the apex of the stipe, they are articulated, or pluricellular; and a capitulum of confervoid filaments completes the frond." A similar view of the question had been already promulgated by Montagne in 1845 (Ann. Sci. Nat. xviii. pp. 262–3), when he flatly denied the truth of Kützing's observation (*Ueber die "Polypiers calcifères" des Lamouroux*, 1841, p. 11) that the filaments of the capitulum are not septate. Yet Kützing was right, and Montagne wrong.

Passing now to the other genus—*Rhipocephalus*—we find in the British Museum Herbarium a remarkable and unique specimen (fig. 3). It was collected on the coast of Florida by Rugel, and was acquired by the Museum with Shuttleworth's herbarium. It might at first sight be regarded as a new species; but, after a careful study of numerous specimens of *R. Phœnix* in about half a dozen herbaria, we are convinced that Rugel's plant must be referred to this species, though much exceeding normal specimens in length of stem and flabella. *R. Phœnix* is a most variable species in shape and size. In normal specimens the terete calcified stem varies in length from 30 to 90 mm. The upper part (usually 20–40 mm.) is concealed by the capitulum, the component flabella of which are about 5–20 mm. long. The capitulum varies much in shape, being round, oblong, conical, or irregular. The flabella are usually ascending, and may be long or short. Each flabellum is a calcified, monostromatic, cuneate lamina, composed of a number of filaments closely coherent side by side, and arising from a single basal filament by repeated dichotomies. The diameter of the filaments is 75–100 μ.

The length of the flabella varies greatly in different plants, and produces marked differences of external appearance. It is possible to trace a series of forms passing from the type to two opposite extremes, in one of which the flabella are short (5–10 mm.), ascending, closely imbricated into a sort of cone of overlapping scales or collars; in the other extreme the flabella are long (upwards of 20 mm.), irregular, variously and deeply laciniate, never (except, perhaps, in youth) united into trim, perfoliate collars, but having a ragged unkempt appearance. To the former of these extremes we give the name *brevifolia*, and to the latter *longifolia*; but we are unable to regard them as more than mere forms grading insensibly into the type.

The type of *Rhipocephalus Phœnix* is no longer in existence, but there is a satisfactory figure of it in Ellis and Solander's *Natural History of Zoophytes* (1786), p. 126, tab. 25, fig. 2, under the name *Corallina Phœnix*. It has flabella of about 15 mm. long.

We think that there are three main forms of *R. Phœnix*, which should be defined as follows:—

1. Forma *typica*, flabellis c. 15 mm. longis, capitulum oblongum æqualem efformantibus.

Hab. Unknown.

2. Forma *brevifolia*, flabellis 5–10 mm. longis, sæpius in verticillos ascendentes vaginantes dense imbricatos lateraliter conjunctis, comam comptam sæpe elongato-conicam efformantibus; stipite usque ad apicem capituli percurrente.

Hab. Bahamas, Bemini Harbor, in 1–6 dm. of water at low tide, *M. A. Howe*! (No. 3239). Guadeloupe, *Mazé*! (No. 24, 1re Série) in Herb. Brit. Mus.

3. Forma *longifolia*, flabellis 20 mm. et ultra longis, irregularibus, profunde et irregulariter laciniatis, ascendentibus vel divergentibus, comam horridulam efformantibus.

Hab. Florida, Key West, on sandy bottom in 6 dm. of water at low tide, *M. A. Howe*! (No. 1612). Florida, *Rugel*!

Rugel's plant, of which we give a figure (fig. 3), differs strikingly from normal specimens, as we said above, in the great length of its stem (150 mm.) and of its flabella (48 mm.). Yet, though twice as long as any other specimens that we have seen, it is nothing but a giant example of our form *longifolia*, differing in no respect (apart from size) from ordinary specimens; for instance, the flabella have the normal characteristic structure of *R. Phœnix*, being composed of laterally coherent filaments which have a diameter of 75–100 μ. Though the flabella exhibit an unusual degree of spreading, this is largely due to their accidental displacement during drying, and is not natural; for the effect of gravitation upon the flabella when submerged would be very slight, and would be more than counteracted by the buoyancy derived from the clinging or imprisoned bubbles of oxygen gas evolved by the plant during the process of photosynthesis under a tropical sun. During life the flabella were probably suberect. From prolonged apical growth the stem attained its remarkable length; year by year it produced gradually longer and longer flabella at its apex, the older and shorter ones falling off below. In this respect it is the antithesis of the form *brevifolia* in which the flabella never exceed a length of 10 mm., though the stem may grow up to a length of 80–90 mm.

In conclusion, we should like to thank Mr. M. A. Howe for placing at our disposal such excellent material, and for the benefit of his observations and experience. We have also to thank him for putting before us some fine and recently gathered specimens of the rare and almost unknown *Rhipocephalus oblongus*, an account of which will be published later on.

EXPLANATION OF PLATE 468.

1. *Penicillus pyriformis* sp. n. — *a*. Plant from Bahamas (*M. A. Howe*, No. 3236), natural size. *b*. Dichotomy of branch, showing absence of septa at constrictions, × 40.

2. *P. Lamourouxii* Dec. var. *gracilis*, var. n. — *a*. Plant from Key West (*M. A. Howe*, No. 1412 *b*), natural size. *b*. Dichotomy of branch, showing that the constrictions are not septate.

3. *Rhipocephalus Phœnix* Kuetz. forma *longifolia*, f. n. — Plant from Florida (*Rugel*), natural size.

NOTES ON LIMONIUM.

By C. E. Salmon, F.L.S.

III.—Limonium vulgare Mill.*

Linnæus (Sp. Pl. edit. i. 1753, 274) gave only the following short diagnosis of this plant:—"*S. Limonium. Statice caule nudo paniculato tereti, foliis lævibus.*" Under this were probably included both *L. vulgare* Mill. and *L. humile* Mill. (*S. bahusiensis* Fr.); in fact, the specimen in Linnæus's herbarium labelled, "2. *Limonium*" in his own handwriting, is undoubtedly the latter species.

Miller, in his *Gardeners Dictionary* (ed. viii. n. 1, 1768), gave the following description of *Limonium vulgare*:—"Foliis ovato-lanceolatis, caule tereti nudo paniculato. Sea Lavender with oval spear-shaped leaves and a taper paniculated stalk. *Limonium maritimum majus*. C. B. P. 192. Common great Sea Lavender"; and stated that it grew in several parts of England in marshes "flowed by the sea." A specimen named by Miller is in Herb. Brit. Mus.

In 1832, E. Fries realizing that the name *S. Limonium* of Linn. Fl. Suec. (1755), ed. ii. n. 270, p. 99, covered two plants, separated them under the names *Statice Limonium Scanica* and *S. Limonium Bahusiensis*, giving an accurate account of both, and contrasting them (Nov. Fl. Suec. Mant. i. 10).†

Six years later, Drejer (Fl. Excurs. Hafn. 121) gave a more detailed account of the two plants. Although quoting Fries's varietal names, but raising the plants to the rank of species, he called the plant under discussion *S. Behen* and the other *S. rariflora*: the latter he considered only differed from the *Bahusiensis* of Fries in its small size. I may mention here that Drejer quoted as synonyms Miller's names as adopted in this paper.

Fries later (Summ. Veg. Scan. i. 1846, 200) recognized the two as species; he allowed Drejer's name, *S. Behen*, to stand in place of his *scanica*, but reinstated *S. bahusiensis* with two segregates, *borealis* and *danica*—the latter to represent Drejer's *rariflora*. These forms will be dealt with later. We have thus, both from

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* See Journ. Bot. 1903, 65; 1904, 361.

† See Mr. Britten's note in this Journal, 1904, 353, where the date of Drejer's *S. Behen* should be *1838*.

Fries and Drejer, good *comparative* descriptions of *L. vulgare*, supplemented in 1848 by those given by Boissier in De Candolle's *Prodromus*, xii. 644.

Boissier called the aggregate plant *Statice Limonium* Linn., and proposed three varieties: *α genuina*, inhabiting the Mediterranean region and middle Europe; *β Behen* (the plant of Drejer and Fries), found in Northern France, England, North Germany, and Denmark; and *γ macroclada*, growing upon the shores of the Adriatic, Sicily, Rumelia, and Syria. The last variety is, it appears, quite a Southern-Europe plant, and we will first discuss the other two varieties.

In our British floras, we find that Syme (Eng. Bot. edit. iii. 1867, 160) arranges both *L. vulgare* and *L. humile* as subspecies under *S. Limonium* L., calling the former *S. Behen* Drej. (equivalent to Boissier's *β Behen*), with a variety *β pyramidalis* (equalling Boissier's *α genuina*). I have been enabled, through the courtesy of the authorities of several continental herbaria, to examine Boissier's own specimens, and have arrived at the conclusion that Syme's arrangement of synonyms is accurate as far as it goes.

Babington (Man. Brit. Bot. 1881, 293) and Hooker (Stud. Fl. Brit. Is. 1884, 259) practically follow Syme, with some slight alterations of nomenclature.

Let us now carefully examine our British forms and compare them with book descriptions. Syme (*l. c.*) relied upon the following characters to distinguish his plants:—*S. Behen.* Panicle compact, subcorymbose, nearly level-topped; branches short, stiff; spikes rather dense, elongate, at length usually recurved. *β pyramidalis.* Panicle very lax, pyramidal, the lateral branches widely spreading, flexuous; spikes short, rather lax. Kent, Sussex, and Dorset. Boissier's descriptions (*l. c.*) for the same two plants are:—*β Behen:* paniculæ arrectæ condensatæ ramis erectiusculis, spicis plus minus densifloris, bracteis dorso late herbaceis. *α genuina:* paniculæ dense corymbosæ ramis abbreviatis subpatulis, spicis densifloris.

In the genus *Limonium* the branching of panicle and density of spike seem to be very variable in different individuals of the same species, and it would not do to rely too much upon these characters; Syme himself considered that his variety *pyramidalis* differed "from the ordinary form merely in luxuriance, and the more luxuriant the plant is, the more lax and pyramidal the panicle becomes." In an examination of living plants of this variety and the ordinary form, and also of a large series of dried specimens (including examples of both forms collected and named by Syme himself) from various parts of Britain and the Continent, there seemed available practically no feature, save size and luxuriance, by which the variety could be separated.

Mr. F. Long, of Norwich, who has known the so-called variety "*pyramidalis*" at Wells for many years, tells me that the largest and most luxuriant specimens there grow on the slopes of a bank that are drier than the rest of the surrounding marsh, and that these flower a fortnight or so later than the smaller plants. There is, however, he says, every gradation of form between the com-

pact subcorymbose short-branched level-topped plant and the lax longer-branched pyramidal form, and these intermediates are very numerous. The remark that the "variety" seemed to prefer the drier parts of the marsh is directly opposed to Syme's statement that "when the salt marsh was drier than usual, the panicle had a tendency to revert to the commoner form." The lateness of flowering remarked by Mr. Long and other observers may be due to the plant requiring longer time to produce the finer scape and more extensive panicle, encouraged by some *local* condition of soil, degree of moisture, &c. Pfeffer (*Physiology of Plants*, English ed., ii. 116 (1903)) says :—"Either an excess or deficiency of food may suppress the formation of flowers; in the first case, owing to the excessive development of the vegetative parts, and in the second because a starved plant lacks the vigour required for the production of reproductive organs. If not too severe, however, partial starvation usually accelerates the formation of reproductive organs on a previously well-nourished plant."

The above observations, which agree with my own, show that *L. vulgare*, known to be a very variable plant both as regards leaves and scape, alters its *facies* very greatly in the same country under local conditions connected with its habitat. Thus, sea lavenders grow on banks bordering dykes some little way from the sea, or in salt-marshes which vary much in humidity according to the season; also, some examples may occur below high-water mark, and be submerged at each tide—this in itself causes certain peculiarities (flexuous spikes, &c.). Again, under the hot southern sun, the plant—particularly if growing on drier ground than usual—shows a tendency to produce a taller scape, finer in all its parts, than in more northern countries; Syme's "*pyramidalis*" is chiefly found in the southern part of England, and further south a still more luxuriant form or variety appears, the "*macroclada*" of Boissier, which is another step further away from the normal plant of England and Northern Europe. Analogous to this would be *Castalia speciosa* and its var. *minor*, which is found chiefly in more northern stations.

Dr. L. M. Neuman tells me that the luxuriant form of *L. vulgare* sometimes occurs in Sweden, where it is distinguished as the "f. *pinguissima*" of *Statice scanica*.

However, the name "*pyramidalis*" is of longer standing, and it will be convenient to distinguish our tall and luxuriant specimens of *L. vulgare* as f. *pyramidale*.

We will now examine Boissier's "γ *macroclada*," described in DC. *Prodromus*, xii. 645, as follows :—"Sæpe glaucescens, paniculæ ramosissimæ ramis elongatis patentissimis, spicis laxis vel densis scorpioideis. Ad littora maris Adriatici, Siciliæ, Rumeliæ, Syriæ." I believe this is widely distributed in Southern Europe, stretching much further west than the Adriatic—in fact, to Spain and Portugal.

In Gillet and Magne's *Nouv. Fl. Française*, ed. vii. 406 (1898), it is thus described (under the synonym *S. serotina* Reichb): "Bractée int. 2 fois plus longue que l'extér.; épillets plus petits, espacés; panicule à rameaux étalés, flexueux; feuilles coriaces, oblongues,

réfrécies en un très long pétiole." "*S. Limonium* L." is credited with having "bractée int. une fois plus longue que l'ext. ; épillets gros, imbriqués, formant une panicule corymbiforme; feuilles molles, oblongues, spatulées."

Last summer, whilst botanizing with Messrs. J. W. White and C. Bucknall upon the French coast near Narbonne, plants that agreed well with Boissier's description of *macroclada* were often seen. The glaucous leaves, and very elongated patent branches forming a panicle broader than long, gave the plant a *facies* unlike that of any British specimens I have seen of *L. vulgare ;* the calyx, too, seems usually only $2\frac{1}{4}$–$2\frac{1}{2}$ lines long, and so is smaller than in the normal plant. I have failed to observe the other distinctions noted by Gillet and Magne, and I fear the bract and leaf differences will not be found to hold good in actual examination. The bracts of my Narbonne examples exactly match those of type-specimens of Syme's "*pyramidalis*."

Although I should hesitate to regard the variety "*macroclada*" a native of these islands, Dr. L. M. Neuman labelled a plant of Rev. E. S. Marshall's gathering at Eastbourne, Sussex, 1885, "Sine dubio var. *macroclada*." The specimen he saw has very spreading branches, and certainly a general look of this variety, but I prefer to consider this solitary example an extreme and unusual state of the f. *pyramidale*, as it possesses calyx-teeth very bluntly pointed—a peculiarity almost unknown in our British forms. Mr. Marshall tells me that he thinks the plant had not the glaucous leaves of *macroclada* when fresh. It seems that this variety is quite a southern form, and unlikely to occur in England.

The variety *macroclada* can evidently be very lax-flowered—a specimen in Herb. Boissier has spikes reminding one of *L. humile ;* they are unilateral, and the spikelets are distant and 1-2-flowered. There are barren branches and empty bracts, and the calyx, &c., belong to *L. vulgare* and not *L. humile*.

As mentioned before, this variety is the 964 *S. serotina* Rchb. (Rchb. Fl. Germ. 1134, c. ic. 998), and also his 1516 *S. scoparia* Pall. (Rchb. Pl. Crit. iii. ic. 391 ; Fl. Germ. Excurs. 1135). Type-specimens of both have been seen in the Kew, Kiel, and Boissier herbaria; the plant at Kiel from "Osero, in Sumpf am Seestrande. Aug. Noë"; that in Herb. Boissier is labelled, "Salinen von Zaule b. Trieste. Magistratsrath Tommasini."

In Gussone's Syn. Fl. Sic. ii. Supp. 805 (1843), we find a fresh name, *S. drepanensis* Tineo. The description given shows that it might well be classed as a lax-flowered state of Boissier's *macroclada* (mentioned above), but the statement, "ramis .... tuberculato-scabris," seems sufficient to keep it distinct from that, at any rate as a variety. Specimens in Herb. Boissier show the rough upper branches well, and the lax spikes of flowers.

In 1897 Dr. L. M. Neuman called attention (Bot. Notiser, 203) to a variety of *Statice scanica* Fr. (*L. vulgare*), which he named "*hallandica*." According to him, *L. vulgare* is confined, in Sweden, to the Oresund coast, and *L. humile* to Bohuslän and Halland's Vädero, situated on the frontier between Skane and

Halland. In 1895, immature examples were sent to Dr. Neuman by Dr. G. Tillman from Onsala parish, in the north of Halland, and were judged to be *L. humile* in a very early stage of growth. In 1896 Dr. L. M. Neuman was able to visit the locality himself, and he at once saw that the plant was neither *L. humile* nor *L. vulgare*, as he knew them in their other Swedish localities, and decided to call the plant "*S. scanica* Fr. var. *hallandica*," after its Swedish habitat. His description (slightly condensed) is as follows:—*Stems* 15–25 cm. high, branched only near the top; *leaves* succulent, about equalling the scapes, pinnately-veined with 5–6 thin and obvious lateral veins; lamina usually only twice as long as broad (generally 60 × 30 mm.), broadest at or above the middle; petiole as a rule longer than the blade; *panicle* with branches close together from the stem; *spikes* dense-flowered, the outer recurved, the rest obliquely-ascending or erect, with the lower flowerless portion of branches very short; *bracts* directed outwards from the axis of the spike, all floriferous; *calyx* glabrous, except on two veins on the inner side; veins of calyx cease below the base of the calyx-teeth, which are distinctly longer than broad; *corolla* exceeding tips of calyx by 1 mm.; *flower* with a faint smell of honey.

Dr. Neuman states that his plant has little in common with *L. humile*, agreeing only in the long petiole, weak venation, absence of sterile bracts, and the shape of the bracts; it may be contrasted with *L. vulgare* as follows:—

S. hallandica.	*L. vulgare.*
Lamina about *twice* as long as broad, and broadest *at* or above the middle.	Lamina about *thrice* as long as broad, and broadest *above* the middle.
Petiole long, leaf about *equalling*, or even *exceeding*, scape.	Petiole shorter, leaf *shorter* than, or very rarely equalling, scape.
Panicle branches *close together* from the stem, with *very short* lower flowerless portions.	Panicle branches from *widely-separated* points of the stem, with *long* lower flowerless portions.
Bracts all floriferous.	Bracts often empty below the spikes.
Veins of calyx ceasing *below* base of lobes.	Veins of calyx running *as far as* or *into* lobes.
Corolla exceeding calyx-teeth by 1 mm.	Corolla exceeding calyx-teeth by about 3 mm.

In his *Sveriges Flora* (1901) Dr. Neuman puts forward no fresh characters for his variety. I was enabled, by his kindness, to examine the type and other specimens of the plant, and was at once struck by the long-petioled leaves, branching of the scape, and the peculiar *texture* * and shape of the leaves.

Although this variety may occur with us, perhaps in Scotland,

* When pressed, the leaf appears thin and papery, although the fresh leaves are described as being "köttiga" (= succulent or fleshy, in Dict.).

I have seen no specimens from these islands that could be so named with certainty; an example collected by Mr. and Mrs. A. Bennett at Bosham Creek, Sussex, 1901, was determined by Dr. Neuman, "var. *hallandica* vel ad var. *hallandicam* vergens," but it has not the calyx, leaf-texture, &c., of that variety, and is, I believe, only a small side-shoot of what was once a large plant of *L. vulgare*.

In 1903 I gathered a plant at Bosham agreeing well with *hallandica* as regards length and shape of leaf, but in other details it differed somewhat from that; it will be safer, therefore, for the present, to exclude the variety *hallandica* from our British lists, as no specimens seem exactly to correspond with Dr. Neuman's very careful description.

M. G. Rouy, in a paper upon the genus *Statice* published in the Rev. Bot. System. 1903, 167 *et seq.*, arranged the plants under discussion as follows (his synonymy condensed is added in brackets) :—

STATICE LIMONIUM L. Fl. Suec. 99. (Sensu amplo.)
α *typica* Rouy. (*S. Limonium* L. from Linnæus's localities.)
β *pseudo-Limonium* Rouy. (*S. pseudo-Limonium* Reichb.)
γ *Behen* Boiss. (*S. Behen* Drej.; *S. scanica* Fries.)
δ *Hallandica* Rouy. (*S. scanica* Fr. var. *Hallandica* Neum.)
Subspecies 1. S. BAHUSIENSIS Fries. (*S. bahusiensis* var. *borealis* Fr.)
var. *rariflora* Drej. (*S. bahusiensis* var. *danica* Fr.)
Subspecies 2. S. ANGUSTIFOLIA Tausch. (*S. Gmelini* Koch (non Willd.); *S. Limonium* γ *macroclada* Boiss. (pro parte); *S. Timbali* Gaut.)
f. *serotina* Reichb. (*S. Limonium* γ *macroclada* Boiss. pro parte).
β *Drepanensis* Rouy. (*S. Drepanensis* Tineo.)
Subspecies 3. S. AGGREGATA Rouy. (*S. Limonium* γ *macroclada* Boiss. (pro parte).)
Subspecies 4. S. REMOTIFLORA Rouy.

I am not convinced that all the forms and varieties mentioned in the above list can be successfully separated in the field with any certainty—unless indeed one is satisfied to classify individuals—particularly as M. Rouy's descriptions (which need not be reproduced here) are based considerably upon the variable characters of leaf, panicle, &c.

Of the plants named in M. Rouy's paper and not previously alluded to, I note the following :—

S. PSEUDO-LIMONIUM. Reichenbach's description of this (Fl. Germ. Excurs. 1830, 191) lacks any detail to satisfactorily separate it from the normal *S. Limonium* L. of his day; in Herb. Kew and elsewhere I have seen type-specimens (Fl. Germ. Exsicc. No. 963), and these show that it cannot well be distinguished, even as a variety.

S. ANGUSTIFOLIA Tausch. Described in Syll. Ratisb. ii. 1828, 254. Named specimens in Kew, Herb. Boissier, Brit. Mus., &c., point to the conclusion that this plant is the variety *macroclada* of Boissier, possessing rather smaller and narrower leaves, and more slender and lax spikes, than usual. I doubt if it would be advisable

to separate this even as a variety. *S. Timbali* Gaut., of which I have seen type-specimens in Herb. Barbey-Boissier and Kew, is obviously exactly identical; the label upon the specimens affords the information that the plants are synonymous with "*S. serotina* Reichb. var. *angustifolia* Timb. and Gaut."

S. AGGREGATA Rouy. The author places weight upon the following characters:—Plant much branched; branches elongated and bare for a long distance, with branchlets at their ends bearing small corymbiform cymes with very short spikes formed of spikelets very close together or even imbricate; flowers small; calyx-lobes lanceolate, very acute, with denticulate margin. Of this I have not seen examples named by Rouy, but it is evidently one of the many forms of the very variable "*macroclada*" of Boissier. It is said to occur upon the west coast of France and in Italy (= *S. Limonium* Savi, Pl. Exsicc.).

The *S. bahusiensis*, *S. rariflora*, and *S. remotiflora* of M. Rouy's paper will be discussed later.

The synonymy, descriptions, and European distribution of the plants already dealt with may stand as under:—

LIMONIUM VULGARE Mill. ! Gard. Dict. No. 1 (1768).

L. maritimum majus Bauh. Pin. 192 (1623).

Statice Limonium L. Sp. Plant. ed. i. 274 (1753) (pro parte) (non Herb. !).

S. caule nudo ramoso Hort. Cliff. ! 115 (pro parte) (1737).

S. pseudo-Limonium Reichb. ! Fl. Germ. Excurs. 191 (1830).

S. scanica Fries, Nov. Fl. Suec. Mant. i. 10 (1832).

S. Behen Drej. ! Fl. Excurs. Hafn. 122 (1838).

S. Limonium L. *β Behen* Boiss. in DC. Prod. xii. 645 (1848).

S. Limonium L. *β pseudo-Limonium* Rouy, Revue Bot. Syst. 167 (1903).

Exsicc.—J. Lange, Plant. Europ. Austral. 1851–52, 196! F. Schultz, Herb. Norm. Nov. Ser. Cent. 4, 322! F. Schultz & F. Winter, Herb. Norm. Cent. 2, 138! Hb. Sherard, Oxford! ("*L. marit. majus* C. B. P. 192"). Fries, Hb. Norm. x. 21! Rchb. Fl. Germ. Exsicc. 963! Linn. Hort. Cliff.! (omitting leaves of one spec.). Wirtgen, Hb. Pl. Select. viii. 388! Hansen, Hb. Schles.-Holst. 433! Tod. Fl. Sic. Exsicc.! ("*S. Limonium* L."). Bourgeau, Env. de Toulon, 326! Billot, Fl. Gall. et Germ. 1052! (and *macrocladon* !).

Scapus plerumque *supra medium* ramosus, corymbosus; rami supra basin aliquantum nudi; spicæ erectæ, *patentes vel recurvæ;* spiculæ *contiguæ vel dense imbricatæ;* calyx parce hirsuta, vel fere glabra, *cum costis 2–3 glabris;* costæ calycis *limborum apices haud attingentes;* bractea interior plerumque exteriore saltem duplo longior; styli staminibus *æquales* vel eos *excedentes*, petala emarginata vel *integra.*

Plant variable, from 4 to 18 inches high, glabrous. *Leaves* pinnately veined, very variable in shape and size, usually obovate-oblong, blunt or acute, mucronate or not, long or short-petioled. *Scape* stout sub-terete, branched usually at or above the middle.

Branches bare for some distance near the base, ascending or erecto-patent and arcuate, usually all flowering. *Branchlets* occasionally bearing empty bracts. *Spikes* rather short ascending or ascending spreading often recurved, or shorter and very dense-flowered or longer and lax-flowered. *Spikelets* 1–3-flowered, usually arranged distichously in two close rows and imbricate. *Outer bract* 1–1½ lines long, rarely tinged with purple, broadly ovate-acute or rounded and apiculate, with a broad membranous margin. *Middle bract* 1¼–1¾ lines long, membranous, oblong-obovate, blunt or acute, longer than outer bract. *Inner bract* 2–2⅝ lines long, broadly obovate or ovate, blunt, with broad membranous margin, rarely tinged with purple, usually twice or more the length of outer bract, and half as long again as middle bract. *Bracteole* 1–2. *Calyx* 2½–3¾ lines long, irregularly and sparsely hairy or nearly glabrous, with 2–3 veins quite glabrous (rarely whole calyx glabrous), rarely tinged with purple; veins not reaching to tip of lobes and sometimes only to base; lobes occasionally coloured as corolla. *Styles* equalling or exceeding stamens. *Petals* emarginate or entire.

L. VULGARE Mill. f. PYRAMIDALE.

Statice Limonium L. *α genuina* Boiss. ! in DC. Prod. Sys. Nat. xii. 644 (1848).

S. Behen Drej. var. *β pyramidalis* Syme ! Eng. Bot. ed. iii. 161 (1867).

Limonium vulgare Mill. var. *pyramidale* Druce, Journ. Linn. Soc. 77 (1901).

S. scanica Fr. f. *pinguissima* Neuman ! *in litt.* (1903).

S. Limonium L. *a typica* Rouy, Revue Bot. Sys. 167 (1903).

Scape at least 12 inches high, and whole plant finer and more luxuriant in all its parts; *branches* ascending-patent, or spreading-arcuate, forming a lax pyramidal panicle; *spikes* often lax. *Flowers* usually a little later than type, with which it grows, and into which it passes.

Distribution.—England ! Scotland ! Wales ! France ! (N., W., and S. coasts) Holland ! Germany ! Denmark ! Sweden ! E. and N. Spain ! Portugal ! Italy ! Sardinia ! Austria-Hungary ! Greece, Belgium, Crete, Eastern Thracia, Roumania.

Distribution in Great Britain.—*1. *Cornwall West. W. R. Linton* (fide *A. Bennett*). — 3. *Devon South.* Dawlish Warren ! 1877, *W. M. Rogers.* — 4. *Devon North.* Braunton Burrows ! 1833, *H. C. Watson* (*Herb. Watson*). — *5. *Somerset South.* Lilstock ! 1897, *J. W. White.* — 6. *Somerset North.* Clevedon ! 1852, *M. M. Atwood* (*Herb. Brit. Mus.*).—9. *Dorset.* Arne ! 1884, *R. P. Murray.* —10. *Isle of Wight.* Freshwater Mill ! 1843, *Herb. Bromfield.*—11. *Hants South.* Portsmouth ! 1836, *J. C. Macreight* (*Herb. Edinburgh*).—13. *Sussex West.* Thorney Island ! 1826 (*Herb. Borrer*).—14. *Sussex East.* Pevensey ! 1873, *F. C. S. Roper* (*Herb. Brighton*). —15. *Kent East.* Rochester ! 1802, *Herb. J. E. Smith.*—16. *Kent West.* Stroud ! 1838, *Herb. G. Luxford* (*Herb. Edinburgh*). — 18. *Essex South.* South "Bamfleet" (Benfleet) ! *John Hill* (1716–1775) (*Herb. Brit. Mus.*).—19. *Essex North.* St. Osith ! *Herb. E. Forster.* —25. *Suffolk East.* Aldborough ! 1870, *W. M. Hind* (*Herb. Brit.*

Mus.).—*27. *Norfolk East.* Cley! 1831, *W. Whitear* (*Herb. Brit. Mus.*).—28. *Norfolk West.* Holme! 1866, *J. B. Syme* (*Herb. Watson*).—[29. *Cambridge.* Babington Cat. in Top. Bot.]—*34. *Gloster West.* Avonmouth! 1878, *J. W. White.*—41. *Glamorgan.* Port Eynon! 1839, *Herb. E. Lees* (*Herb. A. Bennett*).—44. *Carmarthen.* Motley Cat. in Top. Bot.—48. *Merioneth.* Barmouth! 1868, *J. P. Jones.*—49. *Carnarvon.* Robinson Cat. in Top. Bot.—*50. *Denbigh. Dr. Russell* (fide *A. Bennett*).—52. *Anglesey.* Aberffraw! 1828 (*Herb. Kew*).—53. *Lincoln South.* The Wash! *T. Butler* (*Herb. Watson*).—54. *Lincoln North.* Grimsby! 1879, *C. J. Wild* (*Herb. Brit. Mus.*).—58. *Cheshire.* Wallasey Pool! 1847 (*Herb. Watson*).—*59. *Lancashire South.* Garston! 1802, *Bostock, Herb. Withering* (*Herb. J. E. Smith*).—60. *Lancashire West.* Fleetwood! 1848, *J. C.* (*Herb. S. H. Bickham*).—*61. *York South-east.* Robinson's Flora, 1902, p. 140.—62. *York North-east.* Coatham! 1852, *J. G. Baker* (*Herb. Watson*).—66. *Durham.* Hartlepools Lake! 1841, *M. B.* (*Herb. A. J. Crosfield*).—68. *Northumberland North.* Holy Island! 1822, *Herb. J. E. Smith.*—69. *Westmoreland* (incl. *N. Lanc.*). Walney Island! 1901, *F. Long.*—70. *Cumberland*! *Herb. C. C. Babington* (*Herb. Brit. Mus.*).—72. *Dumfries.* Gray Cat. Co. in Top. Bot.—73. *Kirkcudbright.* St. Mary's Isle! 1831, *G. N. Lloyd* (*Herb. Brit. Mus.*).—74. *Wigton.* Galloway! 1831, *Lloyd* (*Herb. Edinburgh*).—85. *Fife.* "*J. W. Brown*" in Top. Bot.—[112. *Shetland Flora;* in Top. Bot.]

The form *pyramidale* occurs in 5, 9, 10, 11, 13, 14, 15, 16, 18, 19, 25, 27, 28, 41, 48, 58, 60, 73.

L. vulgare is not recorded for Ireland. In the Channel Islands it is supposed to be extinct in Guernsey, although it occurred without doubt there in 1835! (Herb. Edinburgh); for Jersey it appears it was recorded in error by Mr. B. Saunders.

For the county records above mentioned I have noted the earliest occurrences for the plant from herbarium specimens examined: those additional to the list in Watson's Top. Bot. are marked *.

L. VULGARE Mill. var. MACROCLADON.

S. Limonium L. var. *macroclada* Boiss.! DC. Prodr. xii. 645 (1848).
S. limonoides Bernh. ex Link, Enum. Hort. Berol. i. 295 (1821).
S. Gmelini Koch, Syn. Fl. Germ. ed. 2, 684 (1843) (non Willd.).
S. angustifolia Tausch. in Syll. Ratisb. ii. 254 (1828) (narrow-leaved state).
S. serotina Reichb.! Fl. Germ. Excurs. 191 (1830).
S. scoparia Reichb.! (non Pall.) Fl. Germ. Excurs. 191 (1830).
S. serotina Reichb. var. *angustifolia* Timb. & Gaut.! in Hb. Barbey-Boissier (narrow-leaved state).
S. Timbali Gaut.! in Hb. Barbey-Boissier and Kew (narrow-leaved state).
S. aggregata Rouy, Rev. Bot. Syst. 169 (1903).

Exsicc.—F. Schultz, Herb. Norm. Cent. 4, 324! Soc. Rochelaise, 1901, 4786! Soc. Dauphinoise, 2 sér. 1890, 194! Fl. Exsicc. Austro-Hungarica, 255! Iter Alban. alt. 1894, 183! Billot, Fl. Gall. et Germ. 1052! (and type). Welwitsch, Iter Lusitan. 45

and 50! Rchb. Fl. Germ. Exsicc. 1516, 29, and 964! Mabille, Hb. Corsicum, 169!

Decidedly glaucous; leaves as in *L. vulgare*, very variable in shape and size, sometimes small and narrow (*S. angustifolia* Tausch.); scape 12–20 inches high, branched usually low down with long remarkably patent, arcuate and recurved branches and branchlets; panicle very much branched and often broader than long; spikes short and dense-flowered, or long and lax-flowered, scorpioid; calyx usually smaller than in *L. vulgare* and f. *pyramidale*, about $2\frac{1}{4}$–$2\frac{1}{2}$ lines long (see tab. 466, fig. 5, Journ. Bot. 1904).

Distribution. — S. France! W. France! S. Spain! Portugal! Italy! Sicily! Corsica! Sardinia! Austria-Hungary! Turkey South! Greece! Russia (Black Sea)! and Transcaucasia! Adriatic Sea and Rumelia (Boíssier).

L. VULGARE Mill. var. DREPANENSE.

Statice Drepanensis Tineo, ex Guss. Syn. Fl. Sic. Supp. ii. 805 (1843).

S. serotina Reichb. *β drepanensis* Rouy, Rev. Bot. Sys. 169 (1903).

"Ramis numerosis divaricatis scapoque elato tuberculato-scabris .... spicis secundis, floribus laxiuscule seriatis . . ."—Guss. *l. c.*

Distribution.—Sicily!

L. VULGARE Mill. var. HALLANDICUM Journ. Bot. 1904, tab. 466, figs. 3, 6.

Statice scanica Fr. var. *hallandica* Neuman! Bot. Not. 203 (1897).

S. Limonium L. δ *Hallandica* Rouy, Rev. Bot. Sys. 167 (1903).

Scape 6–9 inches high, branched only near summit, with branches springing from stem close together; leaves papery when dried, as long as scape, with petiole usually longer than lamina; lamina about twice as long as broad and often broadest at the middle; no empty bracts at base of spikes; veins of calyx ceasing below base of lobes; corolla exceeding calyx-lobes by 1 mm.

Distribution.—Sweden! Denmark! and North Frisian Islands (Schleswig-Holstein)! E. Frisian Islands, *Dr. L. M. Neuman.*

ADDITIONS TO THE BERKSHIRE FLORA.

By G. Claridge Druce, M.A., F.L.S.

Seven years having passed since the *Flora of Berkshire* was published, it may be well to bring together the additional localities for the rarer plants which have come to my knowledge, and I have to thank the various correspondents who have kindly supplied so many of them.

The additional species discovered in the county are *Cardamine bulbifera*, *Polygala oxyptera*,* *Dianthus deltoides*, and *Euphrasia*

* This was noticed in the "Additions and Corrections," but not included in the text of the *Flora*.

Rostkoviana. Besides these, *Rubus cinerosus*, *R. hostilis*, *R. dasyphyllus*, *R. leucanthemus*, *Euphrasia Kerneri*, *E. stricta*, and *Rhinanthus stenophyllus* have been found, which have either been raised to specific rank or have been differentiated or made known as British since the publication of the *Flora*. *Euphorbia Esula*, as a denizen, has also been added. The county flora therefore now comprises 1006 species; but *Fumaria muralis* and *F. confusa* must be deleted from our list for the present, since the Berkshire plants are now referred by Mr. Pugsley to *F. Boræi*; but with the rediscovery of *Teucrium Scordium* and *Inula Helenium*, which were counted among the extinct species, the number 1006 may stand. To the 199 species of adventitious origin 12 others have been added, thus bringing up the number to 211. Of the doubtful species recorded for the county, one—*Dianthus deltoides*—has been found, but it has been included in the foregoing list.

The changes which are always going on around us are shown by the appearance of *Hieracium murorum* by the railway near Upton; *Arabis perfoliata* and *Verbascum Lychnitis* at Twyford, on the side of a new cutting on the railway; by the rapid spreading of *Senecio squalidus* along our railway systems; by the introduction of *Coronopus didymus* and *Lepidium Draba*, owing to agricultural causes; by the extension of *Impatiens biflora* and *Mimulus Langsdorffii* by the means of streams; and by the rapid increase of *Crepis taraxacifolia* over our arable soils, owing to wind-dispersal of the fruits. The diminution in the number of rabbits in a certain area led to the reappearance of *Inula Helenium*, while their increase in other places has led to the scarcity of the rarer orchids; the lower level of the headwater of the Thames led to the observance of *Teucrium Scordium*, since the drier conditions induced a profuse flowering, whereas in wet seasons the plant would be almost submerged and sparsely flowering. To agricultural changes are also due the appearance of *Vicia gracilis* in great quantity over a considerable space, where it appeared to have thoroughly established itself, and yet in a few years it has apparently disappeared. *Carduus tenuiflorus*, which is a somewhat sporadic plant in the Ock district, appeared in great quantity in a hedgerow near Radley, to which doubtless the wind had blown the fruit.

After the pointing of the stonework at Windsor Castle *Diplotaxis tenuifolia* practically disappeared, but it now shows itself in considerable quantity. The conversion of Boar's Hill into a residential quarter threatens the life of many local species: *Tunica prolifera* has disappeared, and *Campanula rapunculoides* has almost gone, while *Rubus Colemanni* and several other Rubi are doomed; *Nitella mucronata* has also for the time disappeared. The "fern collector" is devastating our copses, and has extirpated the *Osmunda* from two of its few localities. How long will naturalists be content that birds only should be protected from such mischievous marauders?

The examination of the Bicheno Herbarium, which is now at Swansea, by my friend the Rev. H. J. Riddelsdell, has given a few earlier records than those quoted in the *Flora*; and I have found in the library at the Botanic Garden at Oxford some MS. notes by

Sibthorp, written about 1780, containing a list of plants observed "circa Oxford," which actually precede many of the early records given in the *Flora*.

During the meeting of the British Association at Cambridge, in 1904, I took the opportunity of examining Professor Babington's herbarium, which is now preserved in the new Botanical Museum and Herbarium of the University. The herbarium is a large and very valuable collection of, I should say, over 6000 sheets, each species being well represented often by many sheets of specimens. The specimens are well dried and carefully preserved. It is especially rich in Cambridgeshire and eastern county plants, and Salopian plants are also numerous. The specimens collected by Professor Babington in the Channel Islands are also included, and there are many sheets from the Orkney and Shetland Islands. There are but very few examples from the valley of the Upper Thames, Babington having apparently only visited the district in 1847. Among the counties which are well represented is Pembrokeshire; and there are a considerable number from Leicestershire, with which the Professor's family had been long connected. No student of the British flora who wishes to make himself acquainted with the range of variation and the distribution of British plants can afford to neglect this extremely valuable collection now, through the generosity of Mrs. Babington, stored in an accessible herbarium.

In the following list an asterisk denotes that the plant is new to the Flora.

Ranunculus heterophyllus Weber. 5. Farley Hill. — *R. Drouetii* F. Schultz. 5. Loddon, *Jackson* (I have not seen specimens).— *R. Lingua* L. 1. Near Buckland, *Dr. Shadwell*. 2. Ditches near Long Bridges, Oxford, *H. Baker*. 3. Yattendon, *A. Waterhouse*, 1898 (Journ. Bot. 1902, 263). — *R. bulbosus* L. var. *brachiatus* (Schleich.). 4. Boxford. — *R. acris* L. var. *Boræanus* (Jord.). 4. Welford.—*R. parviflorus* L. 2. Sandford, *Miss M. Niven*. 5. Park Place, *Stanton*.

Delphinium Ajacis Reichb. 2. Near West Hendred, in a cornfield, *Mrs. Hayden*. 5. Near Cookham. Casual.

Aconitum Napellus L. 4. Welford Park, *Osmond*. Quite naturalized here, and occurring in great quantity, but I think only the relic of cultivation.

Berberis vulgaris L. 2. Near Abingdon. 4. Beenham, *Rev. W. H. Summers*.

Papaver somniferum L. 2. By the river near Clifton Hampden. Abundant by the railway between Didcot and Cholsey.—*P. dubium* L. *var. *collinum* Boenn. 2. Hinksey; named for me by the late Herr Freyn.

Capnoides claviculata Druce. 3. In a hedge bordering King's Copse, Clay Hill, which is near Stanford Dingley, *A. Wallis*.

Fumaria Boræi Jord. *var. *muralæformis* Clavaud (the *F. muralis* of the Berkshire Flora, according to Mr. Pugsley). 5. Early.

Arabis perfoliata Lam. 3. Bradfield, *S. T. Sheppard*. 5. Woodley, *Summers*. By the railway near Twyford, on recently disturbed soil; it had not occurred in the vicinity for the eight preceding years.

**Cardamine bulbifera* Crantz. 5. Bisham Woods, *Rev. C. B. de Jersey* (Journ. Bot. 1899, 85).

Hesperis matronalis L. 3. Sulham, *Summers*. 5. Shinfield Road, *Wallis*. Alien.

Sisymbrium Irio L. 4. Newbury, *F. Comyns*. A casual. — *S. officinale* Scop. var. *leiocarpum* DC. 2. Boar's Hill. — *S. Sophia* L. 4. Thatcham, *Bicheno*, 1812.

Conringia orientalis Andrz. 4. Padworth. 5. Southern Hill, Reading, *Shinfield*. Allotments, very plentiful in 1900, *Wallis*. Casual.

**Coronopus didyma* Sm. 4. Aldermaston railway, *Dr. Willoughby Smith*. 5. Windsor, in nursery ground, *Everett*. Scarcely more than casual, although likely to spread.

Lepidium ruderale L. 4. Near Reading, *Wallis*. 5. Near Windsor, *Everett*. Colonist. — **L. perfoliatum* L. 4. Near Newbury, *Miss Beales*. Casual, 1899. — *L. Draba* L. 2. Abundant at Lockinge. 4. Emborne Road, *Jackson*.

Isatis tinctoria L. 4. Templeton Kintbury, *Summers*. One or two specimens in clover-fields.

**Polygala oxyptera* Reichb. 3. Near West Ilsley. Named by the Rev. E. F. Linton. See "Additions" to the Flora; but it is not characteristic, and may prove distinct from the plant of Reichenbach.

**Dianthus barbatus* L. 2. Besilsleigh, in a lane far from houses, *Miss Walker*. Alien.—*D. Armeria* L. 1. Near Carswell, *Miss Niven*. In "Additions" to the Flora, as *D. deltoides*; but it proves to be *D. Armeria*. 2. Kennington, a single sp., *Rev. F. W. Stone*. 3. Dry pastures, Clayhill Bucklebury Common, *Wallis*. 5. Prope Windsor, *Sibth. MS.* — **D. deltoides* L. 4. Near Brimpton, 1894–5, *Mrs. Chorley*; the first certain record for the county.

Saponaria Vaccaria L. 2. By the river near Sandford, *Rev. F. J. Stone*. 4. Reading, *Wallis*. Casual.

Silene Cucubalus Wibel, *var. *brachiatus* Jord., teste Freyn. 1. Cumnor.

Cerastium quaternellum Fenzl. 4. Newtown Common, *Bicheno*. 5. Green Park, Windsor, *T. Cox* (Herb. Brit. Mus. 1847). Near Finchampstead Ridges.

Stellaria umbrosa Opiz. 4. Crookham, *Jackson*. 5. Near Sandhurst, *Marshall* (Journ. Bot. 1899, 84). Near Jouldern's Ford.

Arenaria serpyllifolia L. var. **cabra* Fenzl. 1. Cumnor; will probably be found in dry places in the other districts.

**Claytonia perfoliata* Donn. Near the Allotment Gardens, Reading, *A. Ashby*, 1898. Alien, casual.

Hypericum Androsæmum L. 3. Near Bradfield, *Wallis*. 4. Copse between Beenham and Woolhampton, *Summers*.—*H. quadrangulum* (*H. dubium*). 4. Aldermaston Soak, *Summers*. 5. Blackwater, *Marshall* (Journ. Bot. 1899, 84).—*H. elodes* Grufb. 3. Bucklebury Common, *Wallis*.

Millegrana Radiola Druce. 4. Padworth, *Summers*. 5. Bagshot, *Sibthorp MS*. 1780.

Geranium phæum L. 4. Quite naturalized in a meadow at Boxford. — *G. nodosum* L. 2. Besilsleigh, *Miss Walker*. Alien. — *G.*

lucidum L. 4. Avington, *Summers*. Welford. — *G. columbinum* L. 3. Pangbourn, *Herb. Bab.* 1847.

Oxalis stricta L. and *O. corniculata* L. were found in garden ground, Southern Hill, Reading, by Mr. A. Wallis.

Impatiens Noli-tangere L. I find Mr. Stanton's plant from the "Buckinghamshire of the Thames near Henley" is *I. biflora* Walt. The Bishop of Reading tells me he has seen *I. Noli-tangere* at 5. Binfield, but I have not seen specimens. — *I. parviflora* DC. 4. Reading, *S. M. Payne* (Herb. Bab.).

Genista tinctoria L. 1. Near Shrivenham. 4. Padworth, *Wallis*.

Cytisus scoparius var. *Andræanus*. 4. A large clump on Inkpen Common, *Rev. H. D. Butler*. ? Alien.

Trifolium subterraneum L. 5. Between Loddon Bridge and Sandford Mill. In a small gravel waste near footpath leading from Cressingham Shinfield Road to Arborfield Foot-bridge, *Wallis*. — *T. pratense* L. var. *parviflorum* Bab. 2. Sandford, *T. L. Bullock*. 5. Waltham St. Lawrence, *I. H. Burkill* (Journ. Bot. 1901, 235).— *T. medium* L. 1. Near Shrivenham. 5. Finchampstead. — *T. arvense* L. 2. Besilsleigh, *Miss Walker*.—*T. striatum* L. 4. Padworth Common, *Wallis*. Ufton Court, *Summers*. 5. Near Sandford Mill. —*T. scabrum* L. 4. Padworth Common and 5. Near Sandford Mill, *Summers*. I have not seen specimens. — *T. hybridum* L. I sent a large series of the Berkshire plant to Herr Freyn, but he referred none to *T. elegans* Savi; some he named *T. hybridum* forma *parviflora* and some forma *intermedia*, the others typical *T. hybridum* L.

Lotus tenuis Kit. 1. Near Shrivenham. 2. Boar's Hill. 3. Clay Hill, *Jackson*. Near Pepper Lane, Reading, *Wallis*.

Astragalus danicus Retz. Miss E. Morland has been successful in rediscovering this very local species on the Ilsley Downs to the north of West Ilsley, where Miss Humfrey doubtless originally gathered it, and not, as she thought, on the south of that place.

Vicia gemella var. *tenuissima* Druce. Wytham and Eynsham Road, *Boswell* in Britt. Contrib. as *V. gracilis*. 5. Near Strathfieldsaye.—*V. gracilis* Lois. 2. Abundant on Boar's Hill, where it was pointed out to me by the Rev. F. W. Stone in 1899. It has now disappeared. — **V. tenuiflora* Roth, var. *laxiflora* Griseb. 2. Bushy ground near Stevenage, *C. F. Vincent*, 1903; also near Wilcote, Oxon, *Lady Margaret Watney*.—**V. villosa* Roth. 2. Boar's Hill, *C. F. Vincent*, 1904. Railway near Oxford. A rapidly spreading casual in Britain. — *V. hirsuta* S. F. Gray, *var. *angustifolia*. 2. Boar's Hill.

Lathyrus Nissolia L. 5. Crazies Hill, *Ashby*, 1900.—[*L. palustris* L. See note by Mr. Britten in Journ. Bot. 1901, 99, on a plant stated in Miller's Dict. ed. vii. to "grow in Windsor Forest"; probably, as Mr. Britten suggests, *L. montanus* was intended.]

Spiræa Ulmaria L. var. *denudata* Boenn. 5. Coleman's Moor. My experience of this plant does not lead me to consider it as necessarily less healthy than the type. In some districts I have seen it as the prevailing form, and perfectly healthy and matured. —**S. salicifolia* L. 4. Near the mill at Hampstead Marshall, *Miss King*. An alien.

Prunus avium L. 3. Pangbourn, *Herb. Bab.*

Rubus fissus Lindl. 5. Near Wellington College, *Marshall* (Journ. Bot. 1899, 84). — *R. plicatus* W. & N. 2. Cothill on the Ruskin Reserve. 5. Wellington College, *Marshall, l. c.* — *R. erythrinus* Génév. 5. Between Wellington College and Sandhurst, *Marshall, l. c.* p. 95; but, according to the Rev. W. Moyle Rogers, the leaves are untypical. — **R. calvatus* Blox. 5. Boggy fir-wood near Sandhurst, *Marshall, l. c.* — **R. cinerosus* Rogers. 3. Near Streatley.— *R. Borreri* Bell-Salt. *var. *dentatifolius* Briggs. 4. Greenham Common. — *R. Babingtonii* Bell-Salt. *var. *phyllothyrsus* (K. Frid.). 4. Greenham Common. — *R. fuscus* W. & N. *var. *macrostachys* P. J. Muell. and *var. *nutans* Rogers; **R. hostilis* P. J. Muell. and **R. leucanthemus* P. J. Muell. are recorded by the Rev. W. Moyle Rogers for Berks in his Brit. Rubi.

Geum rivale L. 4. Near Inkpen, in an upland situation, *Summers.* At Boxford with *G. intermedium* Ehrh.

Fragaria bercheriensis Druce. Both Freyn and A. von Kerner were disposed to refer this to *F. elatior* Ehrh., but it does not answer to the characters for that species as given in our British text-books. Count Solms-Laubach is inclined to consider it a probable hybrid of *F. elatior* and *F. vesca*, but awaits the result of cultivation before speaking in a positive manner. A continental plant somewhat like it, he tells me, reverted to *F. elatior* in cultivation. It still occurs in the original locality where a white-fruited form also grows. The petals remained till the fruit was ripe.†

**Potentilla recta* L. 4. Waste ground by the Thames at Reading, *Wallis.*—*P. argentea* L. 4. Padworth, *Summers.*

Poterium polygamum Waldst. & Kit. 1. Carswell, *Miss M. Niven.* 3. Clay Hill, Bucklebury, *Wallis.* — *P. officinale* A. Gray. 3. Clay Hill, Bucklebury, *Wallis.* 4. Fobney Meadows and near Stratfield Mortimer Church, *Summers.*

Rosa stylosa Desv. 2. Between Radley and Kennington. 5. Near Strathfieldsaye.

Pyrus torminalis Ehrh. 4. In a hedge near Mortimer Station, *Summers.*— *P. Aria* Ehrh. Pangbourn, *Herb. Bab.* — *P. communis* L. 5. Near Arborfield Bridge, *Wallis.*

**Crataegus Oxyacantha* L. × *oxyacanthoides* Thuill. 1. Wytham. 2. Radley.—*C. oxyacanthoides* Thuill. var. *eriocalyx* (Freyn in litt., sub *C. Oxyacantha*) Druce. 1. Wytham.

Saxifraga granulata L. 1. Carswell, *Miss M. Niven.* 2. Besilsleigh, *Miss Walker.* Near Radley. 4. Newbury, *Bicheno*, 1810. Thatcham, *Summers.* A common plant in the Kennet Valley.

Chrysosplenium oppositifolium L. 3. Banks of the Pang, in a copse near Bradfield, *J. H. Vince.* 4. Sulhampstead, Padworth, *Summers.*

Drosera rotundifolia L. 4. Boxford. 5. Bagshot, *Sibthorp MS.* —*D. longifolia* L. 4. Padworth Common, *Summers.*

Hippuris vulgaris L. 2. Letcombe Bassett.

Epilobium angustifolium L. 5. Circa Henley, *Sibthorp MS.*, 1780.

† [See Journ. Bot. 1898, 125.—Ed. Journ. Bot.]

The earliest record. — *E. roseum* Schreb. 3. Deep ditch near Cold Ash, *Wallis*.—*E. obscurum* Schreb. × *roseum* Schreb. By the river near Blackwater, *Marshall* (Journ. Bot. 1899, 85).

Myriophyllum verticillatum L. 4. Sonning, *J. Downes*, 1830 (Herb. Bab.).

Apium graveolens L. 2. Shippon, *Herb. Bicheno*, 1815.

Carum segetum Benth. & Hook. f. 2. Near Uffington, *Bentall*. 3. Streatley, *R. F. Towndrow*.

**Coriandrum sativum* L. 4. Waste ground, Reading, *Wallis*. A casual.

Pimpinella Saxifraga L. *var. *major* Koch. 1. Cumnor.

Cerefolium Anthriscus Beck. 2. Radley. 4. Near Reading, *Summers*. 5. Coleman's Moor.—*C. sativum* Bess. 5. Island in the Thames near Cookham; also on the Bucks side of Thames near Windsor. Alien.

Œnanthe Phellandrium Lam. 4. Near Mortimer, *Summers*.

Caucalis arvensis Huds. 2. Cholsey, *J. S. Henslow*, 1835 (Herb. Bab.). 4. Newbury, *Herb. Bicheno*, 1812.

Sambucus Ebulus L. 2. Near Kennington. Wayland's Smithy. 4. Aldermaston, single plant, *Summers*.

Galium erectum Huds. 1. Carswell, *Miss M. Niven*. 4. Near Newbury, *Herb. Bicheno*. Boxford. 5. Cookham, forma *ramosior* Beck.—*G. palustre* L. *var. *gracile* Knaf. 1. Godstow and Wolvercote, *teste Freyn*. An intermediate between var. *Witheringii* and the type.

Dipsacus pilosus L. 4. Welford, *Mr. Osmond*. Aldermaston, *Herb. Bicheno*.

Valeriana officinalis L. 3. Pangbourn, *Herb. Bab.*, 1847.

Valerianella olitoria L. 3. Pangbourn, *Herb. Bab.*, 1847.

Erigeron acre L. 3. Bucklebury, *Wallis*. 4. Padworth, *Summers*.

Filago apiculata G. E. Sm. 2. Besilsleigh, *Miss Walker*.

Inula Helenium L. 1. Wytham; after many years' disappearance, owing, probably, to the abundance of rabbits, this handsome species reappeared in Baxter's locality in Wytham Wood, in great quantity and luxuriance, in 1899.

Pulicaria vulgaris Gaertn. 4. By the roadside from Main Mortimer Road to the "Three Firs," *A. Wallis*. Grazebrook, *F. Tufnail*.

Xanthium spinosum L. 5. Waltham St. Lawrence, *Gardening World*, 1898, 502. Casual.

**Ambrosia artemisiæfolia* Bess. 1. Wytham Mill. 5. Bearwood. Shinfield. Alien, casual.

Anthemis arvensis L. 1. Carswell, *Miss M. Niven*.—*A. nobilis* L. 3. Englefield Green, *T. Cox* (Herb. Brit. Mus.). 4. Abundant in lawns, Southern Hill, Reading, *Wallis*.—*A. tinctoria* L. 2. Boar's Hill. Casual.

**Matricaria discoidea* L. 5. Abundant along the road between Twyford and Hurst; a recent introduction.

Tanacetum vulgare L. 5. Shinfield, *Summers*. Old Windsor, *Mosely* (Herb. Brit. Mus.). Jouldern's Ford.

Doronicum Pardalianches L. 4. Aldermaston Park, *A. Galt, Jun.* Near Alden Bridge. The latter locality may be in Hants. Alien.

Senecio squalidus L. Between Reading and Maidenhead. It has increased remarkably about Reading, and is spreading along the Kennet Valley railway, as at Newbury, Kintbury, &c.—*Var. *leiocarpa*. With glabrous achenes, as at Didcot (and as the form *subintegra*), also at Kintbury, *Summers*, and Reading.

Carduus tenuiflorus Curt. 2. Plentiful in the lane between Kennington and Radley in 1901.—*C. nutans* L. Pangbourn, *Herb. Bab.*, 1847.

Centaurea nigra L. var. *decipiens* Syme. 2. Cholsey, *Henslow* (Herb. Bab., 1835).

Hieracium murorum L. var. *pellucidum* (Laest.). 2. In the railway-cutting near Upton, rather plentiful in 1904. From 1894 to 1900 I can say with certainty no hawkweed grew in the chalk cutting. Now the above plant is plentiful and thoroughly established. Its origin is probably the limestone woods of Gloucester or Somerset, whence the achenes have been carried by wind to this place, unless indeed they have come from the college walls of Oxford, where the same form has been established for some years. —*H. vulgatum* Fries *var. *maculatum* (Sm.). 1. Buckland.—*H. rigidum* Hartm. *var. *acrifolium* (Dahlst.). 4. Aldermaston. 5. Blackwater, *Marshall* (Journ. Bot. 1899, 85).

Hypochæris glabra L. 5. Roadside near Virginia Water, *Wallis*.

Taraxacum officinale Weber *var. *alpinum* Koch. 1. Wytham. —*Var. *taraxacoides* Koch. 2. Boar's Hill, named by Freyn, although some plants had the outer phyllaries recurved.

Lactuca virosa L. 5. Field near Whitley Wood, Reading, *Summers*. — *L. muralis* Meyer. 2. Cholsey, *Henslow* (Herb. Bab., 1835).

Campanula Trachelium L. 2. Besilsleigh, *Miss Walker*. Uffington Wood; f. *alba* with more glabrous calyx than usual. 3. Unwell Wood, *C. F. Vincent;* calyx glabrous.—*C. rapunculoides* L. 2. Besilsleigh, *Miss Walker*.—*C. Rapunculus* L. 2. Besilsleigh, *Miss Walker*.

Primula acaulis Grufb. 4. Plants with flowers about half the normal size have been found by Mr. Ross near Welford. — *P. acaulis* × *veris*. A form of this hybrid with solitary flowers having a foliaceous calyx was found on Boar's Hill in 1899, and also at Yattendon by the Rev. A. Simeon. — *P. veris* L. First record "About the 8 of May 'Twas found and gathered a cowslip in Philipson's leas in the parish of Commore [Cumnor], Berks, having a stalk a foot long, 2 inches and a half about in bigness; flowres in number on it 258 and the circumference about them 14 inches and a half. This relation I sent to the Royall Society and [it] is entred in their Publick Register. Colonel John Peacock had it and he gave it me on Holy Thursday even [27 May] when I was with him."—Wood's *Life and Times*, 1674 ed., A. Clark, Oxford, 1892.

Lysimachia vulgaris L. "var. *angustifolia*." 5. Lower end of Virginia Water, *H. C. Watson* (Herb. Kew). — *L. Nummularia* L. 5. In company with Mr. Broome in 1899, I found this plant, after many years' unsuccessful search, fruiting on a ditch-bank near Hurst, and again in 1904. Syme, in E. B., states he has never seen ripe fruit. The capsule is very like that of *L. nemorum*.

Samolus Valerandi L. 1. Ditch in meadow opposite Cassington. 4. Burghfield, *Dr. Stansfield*.

Blackstonia perfoliata Huds. 4. Between Inkpen and Coombe Hill, *Summers*.

Gentiana germanica Willd. 4. Coombe Hill.—**G. Pamplinii* Druce is described in Wettstein's Mon. Gatt. Gent. p. 56, 1896. It occurs at 2. Letcombe, and is a hybrid of *G. germanica* and *Amarella*.

Limnanthemum peltatum Gmel. 5. Thames at Ankerwyck, *Goodenough* (Sm. Fl. Brit. 1800, 226).

Asperugo procumbens L. 4. Speen, *Jackson*. Casual.

Myosotis repens G. Don. 4. Padworth Common, *Summers*. 5. Wellington College.

Symphytum officinale L. var. *patens* (Sibth.). 3. Pangbourn, *Herb. Bab.*, 1847.

Cuscuta europæa L. 5. In great luxuriance and plenty, growing on nettles and hops in a hedge between Sandford Mill and Loddon Bridge, 1903.—*C. Epithymum* Murr. 5. Bagshot, *Sibth. MS.* Coleman's Moor, *Wallis*. Finchampstead.

Solanum nigrum L. 2. Besilsleigh, *Miss Walker*. 3. Bradfield, *S. T. Sheppard*.—*S. Dulcamara* L. var. *tomentosum* Koch. 3. Pangbourn, *Herb. Bab.*, 1847.

Hyoscyamus niger. 2. Besilsleigh, *Miss Walker*. 5. Clewer, *Everett*.

Atropa Belladonna L. 5. Sonning, *Summers*.

Datura Stramonium L. 4. Beenham, *Wallis*. 5. Maidenhead, *Wallis*. Colonist.

Verbascum Lychnitis L. 4. Bradfield, *E. F. Witts MS.* 1836. Plentiful on a railway-bank near Twyford Station, which had recently been denuded of its surface-soil during the widening of the railway in 1899, but I did not see it in 1903; it reappeared in 1904, and Mr. Stanton has also this year found it in the old Wargrave locality.

Linaria Elatina Mill. 1. Pusey, *Boswell*. Mortimer, *Summers*.—*L. repens* Mill. 2. Benson Lock, *R. F. Towndrow*.

Antirrhinum Orontium L. Buckland, *Mrs. Milne* (Herb. Oxf.). 2. Besilsleigh, *Miss Walker*.

Veronica montana L. 5. Near Virginia Water, *Dr. Goodenough* (Sm. Fl. Brit. 1800); the earliest county record.

Euphrasia Kerneri* Wettst. 4. Walbury chalk downs. First found by the writer in 1899.—E. stricta* Host. 2. Cothill on the Ruskin Reserve. First certainly found by me in 1903, but probably some of the records of *E. nemorosa* in my Flora belong to this plant.—**E. Rostkoviana* Hayne. 5. Coleman's Moor, 1901.

**Rhinanthus stenophyllus* Schur. This is the *R. Crista-galli* var. *angustifolius* of my Flora for the greater part.

Orobanche major L. (*O. elatior* Sutt.). 2. Didcot, 1898. 4. Coombe Hill, *Summers*.

Mentha longifolia Huds. *var. *villosa* (Sole). 5. Wargrave, *Mr. Stanton*, 1901. M. Briquet considers *M. villosa* Huds. to be a hybrid of *M. rotundifolia* with *M. longifolia* and *M. viridis*.—*M. piperita* L.

1. Carswell, *Miss M. Niven*. M. Briquet considers *M. piperita* to be a hybrid of *M. aquatica* and *M. viridis*. — *M. verticillata* Huds. *var. *Motoliensis* Opiz f. *purpurea*. 1. Wytham Meadows.—*Var. *elata* Host. 1. Wytham Meadows.—*M. arvensis* L. *var. *Skofitziana* Kern. 1. Godstow. — *M. Pulegium* L. 3. Clayhill. An erect form, *Wallis*.

Thymus Chamædrys Fries. 5. Sandhurst, *Marshall* (Journ. Bot. 1899, 85). Coleman's Moor, Early, &c.

Calamintha arvensis Lam. 2. On a wall at Pusey. 4. Eastfield Newbury, *Herb. Bicheno*, 1812.

Salvia Verbenaca L. 4. Donnington Castle, *Herb. Bicheno*.—*S. pratensis* L. 1. One plant in field at Besilsleigh. 2. Upton, *Miss Fry*. Of casual origin here probably. — *S. verticillata* L. 2. Oxford railway-side. A casual.

Sideritis montana L. 4. Near Newbury, *Miss Beales*. A casual.

Marrubium vulgare L. 5. Near Clewer, *Everett*. Casual.

Lamium hybridum Vill. 3. Sulham, *Wallis*.

Teucrium Scordium L. 1. Wytham Meadows, abundant in one place; the lower level of the river allowed me to reach a marshy spot which I had only cursorily examined before, and here the plant grew in great luxuriance and in full flower. The last Berkshire record was that of Lightfoot in 1780.

Plantago Coronopus L. *var. *tenuisecta* (Wirtg.). 2. Boar's Hill. —*P. uniflora*. Circa Bagshot, *Sibth. MS*.

Littorella juncea Berg. 3. Bucklebury Lower Common, *Wallis*. First record.

Amaranthus retroflexus L. 5. Clewer, *Everett*. A casual.

Chenopodium polyspermum L. 3. Clay Hill Common, *Wallis*. 4. Newbury, *Bicheno Herb.*—Var. *cymosum*. 5. Clewer, *Everett*.—*C. album* *var. *glomerulosum* (Reichb.) *teste* Freyn. 2. Near Oxford by the Thames.—*C. murale* L. 5. Clewer, *Everett*.—*C. hybridum* L. 4. Newbury, *Herb. Bicheno*, as *C. rubrum*. Reading, *J. Downes*, 1831 (Herb. Bab.).—*C. Bonus-Henricus* L. 4. Thatcham, *Summers*. Boxford.

**Salsola Kali* L. 4. Waste ground near Reading, *Wallis*. A casual.

Atriplex deltoidea Bab. 5. Maidenhead, *J. A. Power*, 1838 (Herb. Bab.).

Beta trigyna W. & K. 4. Embankment of Lambourn Railway, *F. Comyns*. Alien.

Polygonum dumetorum L. 5. Copse, Coleman's Moor, *Wallis*. Hedge near Loddon Bridge. — *P. aviculare* L. *var. *denudatum* (Desv.). See Boreau, Fl. du Centre, ed. 3, vol. ii. 559, as a species. This is the plant from the saline meadow at 2. Mareham which received various names from our British experts.—*P. minus* Huds. *var. *albidum* Braun in Flora (1824), 359. 2. St. Neot's Meadow, Abingdon. 5. Near Hurst. — *P. Bistorta* L. 5. Meadow near Coleman's Moor.

Rumex pulcher L. 4. Roadside between Kintbury and Hungerford, *Summers*.

Viscum album L. 3. Surley. 4. On black poplar at Boxford.

Euphorbia Esula L. 2. Riverside between Cholsey and Wallingford, *R. F. Towndrow* (see Journ. Bot. (1900) 400), as var. *pseudo-cyparissias*, but the plant should, I think, be referred to the type; it is not *pseudo-cyparissias*. — *E. Cyparissias* L. 4. Welford Park, *Mr. Osmond*; naturalized here with *Aconitum Napellus*. Wasing, *F. Comyns*.

Thesium humifusum DC. 2. Cholsey, *Henslow* (Herb. Bab., 1835).

Gyrostachis autumnalis Dumort. 4. Near Three Mile Cross, *Dr. Ashby*, and Stanfield. Rather plentiful there in a rough pasture.

Cephalanthera pallens Rich. 2. Between Uffington and Kingston Lisle, *Dr. Shadwell*. Rowstock, *W. W. Taylor*.

Epipactis latifolia All. 2. Uffington Wood, *R. Clement*. — *E. violacea* Boreau. 4. Westbrook, *H. C. Peake*. Welford Park, *Osmond*.

Orchis ustulata L. 3 or 4. West Ilsley Downs, *Miss Morland*.— *O. maculata* L. *var. *ericetorum* (Linton). 3. Cold Ash. 4. Snelsmore Common, &c. 5. Finchamstead, Longmoor, Swinley, Easthampstead, Sandhurst, &c.

Ophrys apifera Huds. 3. Ashampstead, *S. T. Sheppard*.

Herminium Monorchis R. Br. 4. Ham Hill, *Summers*.

Narcissus Pseudo-narcissus L. Aldermaston Soak and copse at Shinfield, *Summers*. — *N. biflorus* Curtis. 5. Near Maidenhead, *J. Woods* (Herb. Borrer). Alien.

Galanthus nivalis L. 4. Copse at Padworth, *Summers*.

Allium vineale L. 2. Cholsey, var. "*floribus proliferis*," *Henslow* (Herb. Bab., 1835). Near Northcourt.

**Muscari comosum* Mill. 2. In a vetch field near Upton, *Miss Fry*, 1891. 3. Streatley, *G. Morrell*. Casual.—*M. racemosum* Mill. 2. Near Rowstock, a mile from a garden, *Miss M. A Hazel*.

Gagea fascicularis Salisb. 1. The Countess of Abingdon found this in Wytham Wood in 1901, probably in Lightfoot's locality of 1780.

Ornithogalum umbellatum L. 2. Rowstock, abundant in a wheatfield, *Mr. J. Hazel*, 1903. I think it is native in Berkshire.

Fritillaria Meleagris L. 2. Fulscote, in East Hagbourn, *Miss Fry*.

Juncus compressus Jacq. 2. On the Kimmeridge Clay, Boar's Hill.

Juncoides sylvaticum Kuntze. 3. Bucklebury Lower Common, *Wallis*.

Sparganium erectum L. *var. *microcarpum* Neum. 5. Pond, Sandhurst, *Marshall* (Journ. Bot. 1899, 85).

Lemna polyrhiza L. 4. Aldermaston, *Summers*.

Echinodorus ranunculoides Engelm. 5. Hurst Green, *R. A. Pryor* (Herb. Brit. Mus., 1873). Still there in 1904.

Potamogeton Drucei Fryer. This is the *P. fluitans* Roth *forma* of my Flora (see p. 516 and Notes and Corrections). It appears to be limited to about three miles of the Loddon, and is remarkably constant in character. Although often showing copious flower, ripe fruit are with difficulty found, the swans being particularly fond of the flowering-spikes. It has remained constant under cultivation, and is a very distinct and beautiful plant, which Mr. Fryer considers

to be a good species, the fruit being unlike that of any known species.—*P. polygonifolius* Pourr. 2. Wootton Bog, *Herb. Boswell.* Now probably destroyed in this locality.

Scirpus setaceus L. 5. Coleman's Moor, *Summers.*

Carex pulicaris L. 5. Coleman's Moor, *Summers.*—*C. Boenninghausiana* Weihe. 4. Greenham Common. — *C. elongata* L. and *C. vesicaria* L. 5. Blackwater, *Marshall* (Journ. Bot. 1899, 85).—*C. elata* All. 5. Coleman's Moor.—**C. elata* × *Goodenowii.* 5. Sandhurst.—*C. acuta* L. *var. *angustifolia* Kükenthal. 2. By the river near Iffley. — *C. strigosa* Huds. 4. Near Brocas Lane Farm, Mortimer, and Silchester Road. 5. Bisham Wood, *Wallis.*—*C. flava* L. var. *lepidocarpa* (Tausch). 5. Early. — C. *Pseudo-cyperus* L. 3. Ditches by Thames near Reading, *Wallis.*

Setaria viridis Beauv. and *S. glauca* Beauv. Casuals near Reading, *Wallis.*

Alopecurus fulvus Sm. 4. Padworth Common, *Wallis.*

Apera Spica-venti Beauv. 5. Early Rise, *Summers.*—**A. interrupta* Beauv. 2. On a wall in Mareham, 1900. Casual.

Catabrosa aquatica Beauv. 4. Woodley, *Summers.* 5. Coleman's Moor, *Wallis.*

Dactylis glomerata L. *var. *abbreviata* Drejer. 3. Field opposite Basildon.

Poa nemoralis L. 3. Pangbourn, *Herb. Bab.*, 1847.—*P. bulbosa* L. 2. This has increased at Cothill on the mud-topped wall. The plant is viviparous.

Festuca Myurus L. 1. Buckland, Pusey, Fyfield. — *F. loliacea* Huds. 3. Pangbourn, *Herb. Bab.*, 1847.—*F. arundinacea* Schreb. 2. The true plant on the Kimmeridge Clay, Boar's Hill.

Bromus commutatus Schrad. 3. Pangbourn, *Herb. Boswell Syme,* 1867.—*B. interruptus* Druce. 5. Near Windsor, *Mrs. Everett.*

Blechnum Spicant With. 4. Near Boxford.

Asplenium Adiantum-nigrum L. 5. Near Arborfield Bridge, near Brough Farm, *Wallis.*—*A. Trichomanes* L. 1. Fyfield Church. 5. Sonning Bridge, *Wallis.*

Ceterach officinarum Willd. 4. Near Hampstead Mill, *F. Comyns.*

Scolopendrium vulgare Symons. 4. Welford.

Osmunda regalis L. 4. Near Welford. The fine plants have been removed from a wood in the Pang district; the Bearwood locality has also been despoiled.

Ophioglossum vulgatum L. 5. Copse near Early, *Wallis.*

[*Botrychium Lunaria* Sw. has just been discovered in Hampshire on the border of the Loddon district by Drs. Ashby and Stanfield.]

Equisetum maximum Lam. 4. Copse near Beenham Church, *Summers.*—*E. sylvaticum* L. 4. Near Boxford.

Lycopodium inundatum L. First recorded in Ray's Hist. 121 (1686).

Chara contraria A. Br. 1. Near Oxford, on margin of Thames. Pond in Wytham Wood.

BIBLIOGRAPHICAL NOTES.

XXXIV.—Redouté's Works.

Some uncertainty attaching to the dates of publication of Redouté's *Liliacées*, it became necessary for the purposes of the Catalogue of the Library at the Natural History Museum to enquire carefully into the matter. This led to the investigation of the mode, and dates of publication of some of his other books, with the following results:—

I.—"Les Liliacées, peintes par P. J. Redouté." 8 vols. fol. Paris, 1802–16.

The text to vols. i.–iv. was by Aug. P. de Candolle; to vols. v. and vi. by F. de La Roche; and to vols. vii. and viii. by Raffeneau Delile.

The work was issued in 80 parts, mostly of 6 plates, with explanatory text. Parts 13 and 62 are cited as having 5 only, but in each case there is a double plate, which is numbered as two; while part 80, which was a double part, had also a double plate, thus accounting for the citation of 11 plates instead of 12 in the *Bibliographie de la France*. The portrait, moreover, was extra, and not included in the number, as there stated.

A large paper copy of the work was begun in 1807, and from vol. iii. ran concurrently with the ordinary one.

The sources of information have been the *Journal général de la Littérature de France* (J.), the *Bibliographie de la France* (B.), and the *Magazin Encyclopédique* (M.).

Vol. I,	pt. 1,	pls. 1– 6	J	1802	July	p. 194
[Title-page	2,	7–12	,,	,,	Sept.	259
dated 1802.	3,	13–18	,,	,,	Nov.	325
Large paper,	4,	19–24	[not cited]			
1807.]	5,	25–30	J	1803	May	131
	6,	31–36	,,	,,	July	295
	7,	37–42	,,	,,	Aug.	327
	8,	43–48	,,	,,	Oct.	391
	9,	49–54	,,	1804	Jan.	4
	10,	55–60	,,	,,	Feb.	36
Vol. II,	11,	61–66	,,	,,	Mar.	68
[Title-page	12,	67–72	,,	,,	May	130
dated 1805.	13,	73–78	,,	,,	July	195
Large paper,	14,	79–84		[,,	Aug.?]	
1807.]	15,	85–90	J	,,	Sept.	259
	16,	91–26	,,	,,	Oct.	292
	17,	97–102	,,	,,	Nov.	321
	18,	103–108	,,	1805	Jan.	4
	19,	109–114	,,	,,	March	69
	20,	115–120	,,	,,	April	99
Vol. III,	21,	121–126	,,	,,	July	195
[Title-page	22,	127–132	,,	,,	Sept.	260
dated 1807	23,	133–138	,,	,,	Nov.	322
in both	24,	139–144	,,	1806	Jan.	4
editions.]	25,	145–150	,,	,,	Feb.	33
	26,	151–156	,,	,,	April	98
	27,	157–162	,,	,,	July	194
	28,	163–168	,,	1807	May	131
	29,	169–174	,,	,,	,,	,,
	30,	175–180	,,	,,	,,	,,

Vol. IV,	pt. 31,	pls. 181–186	J	1807	May	p. 131
[Title-page	32,	187–192	,,	,,	Aug.	225
dated 1808	33,	193–198	,,	,,	Nov.	323
in both	34,	199–204	,,	,,	,,	,,
editions.]	35,	205–210	,,	1808	Feb.	34
	36,	211–216	,,	,,	March	67
	37,	217–222	,,	,,	May	131
	38,	223–228	,,	,,	July	193
	39,	229–234	,,	,,	Nov.	322
	40,	235–240	,,	,,	,,	,,
Vol. V,	41,	241–246	,,	1809	March	65
[Title-page	42,	247–252	[1809 ?]			
dated 1809	43,	253–258	J	1809	June	162
in both	44,	259–264	,,	,,	July	192
editions.]	45,	265–270	[	,,	?]	
	46,	271–276	J	,,	Nov.	321
	47,	277–282	,,	1810	Feb.	34
	48,	283–288	,,	,,	April	98
	49,	289–294	[	,,	?]	
	50,	295–300	J	,,	Sept.	257
Vol. VI,	51,	301–306	M	1811,	Tom. i., p. 410	
[Title-page	52,	317–312				
dated 1812	53,	313–318	[1811 ?]			
in both	54,	319–324	M	1815,	Tom. ii., p. 227	
editions.]	55,	325–330	[a much belated notice.]			
	56,	331–336				
	57,	337–342	B	1811	Nov. 15	53
	58,	343–348	,,	,,	Dec. 28	136
	59,	349–354	,,	1812	March 7	270
	60,	355–360	J	,,	April	98
			B	,,	May 7	378
Vol. VII,	61,	361–366	,,	,,	July 3	486
[Title-page	62,	367–372	,,	,,	Sept. 18	611
dated 1813	63,	373–378	,,	,,	Nov. 6	707
in both	64,	379–384	,,	,,	Dec. 18	793
editions.]	65,	385–390	,,	,,	March 12	105
	66,	391–402	B	,,	July 2	294
	67,		J	,,	May	131
	68,	403–408	B	1813	Sept. 24	407
	69,	409–414	,,	,,	Nov. 12	486
	70,	415–420	,,	,,	Dec. 24	568
Vol. VIII,	71,	421–426	J	1814	May	129
[Title-page			B	,,	June 4	,,
dated 1816	72,	427–432	,,	,,	July 30	202
in both	73,	433–438	,,	,,	Sept. 24	275
editions.]	74,	439–444	,,	,,	Dec. 10	382
	75,	445–450	,,	1815	Feb. 11	75
	76,	451–456	,,	,,	May 20	229
	77,	457–462	,,	,,	Aug. 12	339
	78,	463–468	,,	,,	Dec. 2	511
	79,	469–474	,,	1816	March 2	83
	80,	475–486 and portr. of author	J	,,	Sept.	257
			B	,,	Oct. 5	431

According to the Journ. gén. Litt. Fr., part 75 contained plates 427, 428, 445, 446, 448, 449, and 450, and there may have been an exceptional irregularity in some of the sets as issued; but the notices in the Mag. Ency., which cover the part in question, show the issue to have been regular, and as given above (*cf.* Mag. Ency. 1802, tom. iv, p. 542; 1803, tom. i, pp. 265 & 417, tom. iii, p. 420, tom. iv, pp. 424 & 549; 1805, tom. i, p. 426, tom. ii, p. 193, tom. iv, p. 206, tom. vi, p. 418; 1806, tom. v, p. 184; 1808, tom. i,

p. 444; 1810, tom. i, pp. 221 & 396, tom. ii, p. 373, tom. v, p. 388; 1811, tom. i, p. 410; 1815, tom. i, pp. 197 & 435, tom. ii, p. 227, tom. iv, pp. 216 & 453, tom. v, p. 447, tom. vi, p. 160; 1816, tom. ii, p. 213).

II.—"Les Roses, par P. J. Redouté . . . avec le texte par C. A. Thory," &c. 3 vols. fol. *Paris*, 1817–24.
——— Deuxième édition. 3 vols. 8vo. *Paris*, 1824–26.
——— Troisième édition, publiée sous la direction de M. Pirolle. [With a biographical notice of Thory, by D. Beaumont.] 3 vols. 8vo. *Paris*, 1828–30.

The first edition was issued in 30 parts, each as a rule having 3 sheets of text and 6 plates, and it is possible by computation to say what text each contained. The second edition, in 8vo, was issued in 40 parts, and, in the absence of a copy to inspect, it is not possible to hazard any guess as to the contents thereof. The third edition, also in 8vo, was issued in 30 parts, or, to be strictly accurate, 8 single and 11 double parts, but all attempts to identify the contents by the sheeting given in the Bibl. Franc. failed. In this third edition it should be noted that while the text to each plate is separately paged, the numeration of the sheets is consecutive. It also contains a "Traité du Rosier" by Thory, that was not included in the first edition.

First Edition.

Parts.	Bibliographie de la France.	Contents.		
				pp.
Vol. 1., livr. 1.	22 March, 1817, p. 153.	9 sh.	6 pls.	Titles [=pp. 1–4] 5–36.
2.	24 May, ,, 289.	3	6	37–48.
3.	23 Aug. ,, 473.	3	6	49–60.
4.	1 Nov. ,, 598.	3	6	61–72.
5.	10 Jan. 1818, 10.	3½	6	73–86.
6.	7 March, ,, 130.	3	6	87–98.
7.	16 May, ,, 280.	3	0	99–110.
8.	1 Aug. ,, 436.	3	6	111–122.
9.	17 Oct. ,, 590. [as 11]	3	6	123–134.
10.	9 Jan. 1819, 26.	3	6	135–146.
11.	3 April, ,, 178.	3	6	147–158.
Vol. II., 12.	29 May, ,, 266.	3	6	5–16.
13.	28 Aug. ,, 402.	3	6	17–28.
14.	4 Dec. ,, 558.	3	6	29–40.
15.	15 Jan. 1820, 32. [as 14]	3	6	41–52.
16.	8 July, ,, 371.	*1½	6	53–64.
17.	19 Aug. ,, 455.	3	6	65–76.
18.	28 Oct. ,, 592.	4	6	77–92.
19.	12 Jan. 1821, 25.	*1¼	6	93–100.
20.	31 March, ,, 175.	4	5	101–116.
21.	21 July, ,, 392.	3	6	Titles [= pp. 1–4] 117–124.
Vol. III., 22.	5 Oct. ,, 535.	6	6	5–28.
23.	22 Dec. ,, 694.	3	6	29–40.
24.	16 March, 1822, 173.	3	6	41–52.
25.	1 June, ,, 338.	3	6	53–64.
26.	26 Oct. ,, 653.	3	6	65–76.
27.	11 Jan. 1823, 26.	2	6	77–84.
28.	31 May, ,, 313.	3	6	85–96.
29.	22 Nov. ,, 685.	3	6	97–108.
30.	6 March, 1824, 141.	6	1 port.	Titles [=pp. 1–4] 109–128.

* By an oversight the work is in this instance cited as 4to, and the sheeting wrongly given.

Second Edition.

Livr. 1.	10 Jan. 1824,	p. 20.	½ sh. 4 pls.	Livr. 21.	8 Oct. 1825,	p. 674.	½ sh. 4 pls.
2.	6 Mar. ,,	145.	½ 4	22.	5 Nov. ,,	730.	⅝ 4
3.	17 April ,,	235.	¾ 4	23.	31 Jan. 1827,	94.	½ 4
4.	15 May ,,	300.	⅓ 4	24.	31 Dec. 1825,	915.	⅓ 4
5.	12 June ,,	368.	⅝ 4	25.	28 Jan. 1826,	66.	⅝ 4
6.	17 July ,,	435.	¾ 4	26.	25 Feb. ,,	155.	⅛ 4
7.	14 Aug. ,,	501.	⅝ 4	27.	22 Mar. ,,	238.	½ 4
8.	11 Sept. ,,	547.	¾ 4	28.	19 April ,,	324.	½ 4
9.	15 Oct. ,,	625.	¾ 4	29.	10 May, ,,	412.	½ 4
10.	20 Nov. ,,	702.	⅝ 4	30.	31 ,, ,,	485.	⅝ 4
11.	18 Dec. ,,	794.	⅝ 4	31.	21 June, ,,	549.	½ 4
12.	15 Jan. 1825,	40.	¾ 4	32.	12 July, ,,	613.	½ 4
13.	26 Feb. ,,	138.	⅝ 4	33.	29 ,, ,,	658.	⅞ 4
14.	19 Mar. ,,	185.	½ 4	34.	19 Aug. ,,	716.	⅝ 4
15.	16 April ,,	249.	⅝ 4	35.	13 Sept. ,,	781.	½ 4
16.	14 May ,,	338.	¾ 4	36.	4 Oct. ,,	845.	⅓ 4
17.	2 July ,,	436.	¼ 4	37.	21 ,, ,,	883.	¾ 4
18.	23 ,, ,,	500.	¾ 4	38.	15 Nov. ,,	961.	⅝ 4
19.	13 Aug. ,,	549.	⅝ 4	39.	2 Dec. ,,	1015.	⅓ 4
20.	10 Sept. ,,	619.	½ 4	40.	27 ,, ,,	1106.	⅝ 4

Third Edition.

Livr. 1.	23 Aug. 1828,	p. 637.	2½ sh. 6 pls.	Livr. 17. 18.	18 July, 1829,	p. 498.	⅞ sh. 12 pls.
2.	13 Sept. ,,	683.	2⅜ 6				
3.	4 Oct. ,,	729.	⅞ 6	19. 20.	3 Oct. ,,	668.	2¼ 12
4.	1 Nov. ,,	794.	⅛ 6				
5.	22 ,, ,,	843.	⅞ 6	21. 22.	31 ,, ,,	757.	2½ 12
6.	13 Dec. ,,	896.	½ 6				
7.	10 Jan. 1829,	26.	1 6	23. 24.	5 Dec. ,,	820.	2⅛ 12
8.	21 Feb. ,,	129.	2⅜ 7				
9. 10.	21 Mar. ,,	203.	2¼ 12	25. 26.	23 Jan. 1830,	58.	2⅝ 12
11. 12.	2 May, ,,	306.	¾ 12	27. 28.	27 Feb. ,,	140.	2 12
13. 14.	16 ,, ,,	344.	2 12	29. 30.	10 April, ,,	234.	2¾ 12
15. 16.	20 June, ,,	428.	1⅛ 12				

III.—"Choix des plus belles Fleurs, prise dans différentes familles du Règne Végétal, et de quelques branches des plus beaux Fruits . . . souvent animées par des Insectes," &c.

pp. [*ii*] *20: 144 pls. col.* fol. *Paris*, 1827 [–33].

For this original title, as quoted in Brunet and Pritzel, a later-date one, reduced to the words here printed in "small caps.," was substituted. The work was issued in 36 parts, each consisting of 4 plates in a wrapper, with the addition in the last part of 20 pages of explanatory text by A. Guillemin; the exact contents of each part is unknown.

Bibl. Franc.			Bibl. Franc.		
Livr. 1.	26 May, 1827,	p. 433.	Livr. 9.	2 Aug. 1828,	p. 578.
2.	30 June, ,,	530.	10.	25 Oct, ,,	770.
3.	15 Aug. ,,	674.	11.	3 Jan. 1829,	3.
4.	10 Oct. ,,	833.	12.	7 Mar. ,,	155.
5.	24 Nov. ,,	963.	13.	2 May, ,,	299.
6.	19 Jan. 1828,	44.	14.	27 June, ,,	436.
7.	22 Mar. ,,	211.	15.	22 Aug. ,,	570.
8.	31 May, ,,	396.	16.	3 Oct. ,,	659.

	Bibl. Franc.		Bibl. Franc.
Livr. 17.	5 Dec. 1829, p. 811.	Livr. 27.	11 June, 1831, p. 338.
18.	9 Jan. 1830, 19.	28.	13 Aug. ,, 467.
19.	27 Feb. ,, 130.	29.	5 Nov. ,, 623.
20.	17 April, ,, 243.	30.	31 Dec. ,, 743.
21.	12 June, ,, 378.	31.	17 Mar. 1832, 147.
22.	31 July, ,, 511.	32.	19 May, ,, 275.
23.	9 Oct. ,, 667.	33.	21 July, ,, 403.
24.	4 Dec. ,, 782.	34.	29 Sept. ,, 546.
25.	5 Feb. 1831, 75.	35.	22 Dec. ,, 735.
26.	16 April, ,, 219.	36.	22 June, 1833, 379.

B. B. Woodward.

LEOPOLD HARTLEY GRINDON.

By the death of Leopold Hartley Grindon one of the last of the old school of field-naturalists has been removed from among us. Born in Bristol, where he spent his early years, on March 28, 1818, he soon became interested in wild flowers, and at the age of fourteen began the formation of an interesting series of scrapbooks, in which specimens of plants were mingled with pictures, newspaper-cuttings, and other objects connected with his walks. In 1838 he removed to Manchester, where he became cashier to a firm of cotton-spinners, retaining his post until 1864. By this time he had become well known as a popular writer upon matters connected with natural history; his *Life, its Nature, Varieties, and Phenomena* was first published in 1856; in 1859 appeared his *Manchester Flora; British and Garden Botany*—a combination of the foregoing and of an earlier work with a similar title—came out in 1864; other volumes, including a *Shakespere Flora*, appeared later. *The Fairfield Orchids*, published anonymously in 1872—a list of the orchids grown by a Manchester firm—is a noteworthy example of what a trade catalogue can become in competent hands.

Grindon's writing, like his conversation, was of a somewhat exuberant and fanciful order, but he was always interesting and suggestive, and often original. He had a store of knowledge on many subjects, and this gave a special interest to his addresses, which for many years were a feature of the pleasant if not very scientific excursions of the Manchester Field Naturalists' Society. This was established, mainly by his exertions, in 1860, and he retained the presidency to the end of his life. The *Manchester Flora*, issued more than half a century ago, is not in accordance with our present notions of what such a book should be: it is rather a popular introduction to botany with local information added, but must have been exceedingly useful to those for whom it was prepared.

Grindon's kindly disposition and genial character rendered him deservedly popular in Manchester; his eightieth birthday was the occasion of a representative gathering of citizens at the Town Hall, when he was presented with a purse of £500, and Mrs. Grindon—his second wife, who shared her husband's pursuits—received a portrait of her husband. He died at his residence, Cecil Street,

Greenheys, on Nov. 20, and was buried in the Manchester Southern Cemetery.

An extract from the *Shakspere Flora*, quoted by the *Manchester City News*—to which he had been for thirty years a constant contributor—is characteristic both of Grindon's style and of his outlook on life:—

"It is counted fine to raise a splendid pile of stone or marble, to paint a sublime picture, to compose a brilliant opera. Perhaps a man who multiplies trees of glorious sort—especially when, like the Warwick Castle cedars, they compare with epitaphs—achieves in his day quite as genuinely as good an end. He makes the world richer than he found it, a good feat any man may be proud to accomplish. He can hope in any case, when the sun is sinking in the west, that though his name may slide away and be forgotten, the work he has done, or has essayed to do, so that it has been honest and faithful, may not have been altogether in vain; that it will give pleasure to a thousand hearts yet unborn, and inspire a thousand more to go and do likewise. I would rather be able to reflect in my old age that I had been the originator of a hundred oaks and cedars that in days to come shall help to make my country glad and beautiful, than have it said of me, simply and exhaustively, that my will was 'proved under a million,' and leave no memorial besides."

SHORT NOTES.

LEJEUNEA MICROSCOPICA (Taylor).—I have recently found this rare species growing on specimens of *Metzgeria conjugata* Lindb., collected as far back as August. 1893, by Prof. F. E. Weiss, in Skye; discovered in the South of Ireland by Dr. Taylor, Dr. Carrington and I collected it in 1884 in Borrowdale, Cumberland, and on rocks below Llyn Ogwen, North Wales; later, Mr. Macvicar found it in Scotland, and Messrs. Lett and Waddell in Antrim. When I observed it on the Skye plant I was under the impression it was new to that island, but on referring to Mr. Macvicar's excellent Census of Scottish Hepaticæ in Ann. Scott. Nat. Hist. 1904, p. 52, I find it recorded, Mr. Macvicar having collected it there in 1902. Dr. Wallace, in his *Island Life*, gives Madeira as a station where it has been found.—W. H. PEARSON.

PHYSCIA PARIETINA.—I was very pleased to note that Messrs. Whaldon and Wilson, in their paper on Lancashire Lichens (Journ. Bot. 1904, 258), remarked upon the luxuriance of this plant in the neighbourhood of cowsheds. I have often pointed out this kind of preference of this species to botanists, and especially to my students in our outdoor rambles; and at the meeting of the British Association last August I remarked upon this luxuriance to some of the members during a botanical excursion to Chippenham Fen, as we passed some farm-buildings. This lichen can evidently grow in a more luxuriant manner when subject to the gaseous emanations of, and probably also from the presence of dust from the excretory

products of herbivorous animals. Plenty of nitrogen in an available form is probably the chief factor of this luxuriance. I have also noticed the frequency of these plants quite away from cowsheds and farmhouses, on the walls at the corners of fields where cattle frequently shelter from the wind and rain. Many lichens love to grow in the drive of a moisture-holding wind, such as passes through a mountain valley: *Lecanora tartarea* and *Alectoria jubata* may be taken as examples. If such a drive also goes along a road on which are frequently deposited the excreta of animals, some of the dust from that road is blown upon the neighbouring walls, especially in places where the walls obstruct the force of the drive, and here I have often noticed an extra luxuriant growth of *Physcia parietina*. Another favourite habitat of this lichen is on seaside rocks a little above high-water mark, where it is often associated with *P. aquila*. These rocks have an abundance of saline matter about them, but the luxuriance of *P. parietina* is probably due to the richness in nitrogen of the rock-surface, caused by the occasional droppings of sea-birds on these rocks. The growth of certain genera of algæ in relation to rich supplies of nitrogen is also a fact on which I may write some details at a future date.—Wm. West.

Salicornis procumbens Sm.—In the *Flora of Hampshire*, ed. 2, p. 639, this plant is recorded on my authority as "abundant in Thorney Island" (W. Sussex). This is due to a misunderstanding; I did not see it there at all, whereas *S. appressa* Dum. was plentiful. Edward S. Marshall.

Rosa rubiginosa L., var. jenensis M. Schulze.—In Babington's *Manual*, ed. 9, p. 136, this variety is stated to have "ped. recept., and back of the sep. glandular," which are, of course, characters of the *type*. It is a misprint for "eglandular."—Edward S. Marshall.

A Coast Œnothera.—Recently an unknown form of *Œnothera* (previously called *ammophila*) has appeared on sandy shores of western Germany. It is very near *Œ. muricata*, but it has much larger flowers, resembling those of *Œ. biennis*. The origin of the plant is unknown; perhaps in other localities it may have been not distinguished from *Œ. biennis*. In G. Don's Dichlamyd. Plants, ii. p. 685 (1832), the author says that *Œ. biennis* occurs "particularly between the first and second ranges of sand-banks on the coast of Lancashire, a few miles north of Liverpool, in the greatest abundance"; and a few lines further he asserts: "on the dreary sand of our Lancashire coast it is truly wild." The German plant grows under exactly the same circumstances. It would be interesting to know if the Lancashire plant is indeed the true *Œ. biennis*, and whether it grows there still.—W. O. Focke.

[We sent Dr. Focke's note to Dr. C. T. Green, in whose *Flora of the Liverpool District Œnothera biennis* is recorded from several localities. Dr. Green promises to send specimens to the Museum for identification when the flowering season comes round, and writes: "It is yet to be found in plenty between Crosby and Southport, and to us it seems to spread along the railway on both sides, though especially on the sea side of the line. It also has made its

appearance on the Cheshire sandhills just north of Birkenhead, about Bidston Junction, where several lines converge; I can remember some twelve years ago there was none of it here, though I had met with a plant or two occurring by themselves and not in quantity, some miles away in other parts of Wirral."—Ed. Journ. Bot.]

Verbena Prichardi.—By a regrettable oversight the new species of *Verbena* collected by Mr. Prichard in Patagonia was named (Journ. Bot. 1904, 370) *V. bonariensis*, a name already occupied. I therefore propose to call the species **V. Prichardi.**—A. B. Rendle.

Liparis longipes Lindl. — Mr. J. Sparkes has sent to the National Herbarium, for determination, a specimen of this orchid, tubers of which he received from the Johnstone River, North-east Queensland. The plant, though widely distributed in Tropical Asia from India to New Guinea, and northward to Hong-kong and Canton, was not previously known from Australia. The flowers of the Queensland plant are slightly larger than in Asiatic specimens, with the recurved end of the lip broader and blunter than usual, recalling that of var. *spathulata* Ridley (*L. spathulata* Lindl.), though not trilobulate. The locality is the same as that from which we previously described an Australian variety of another New Guinea Orchid, *Dendrobium Hollrungii* Kränzl. (see Journ. Bot. 1899, 339). The plant, which Mr. Sparkes received quite fifteen years ago, has recently flowered at Ewhurst, Surrey.—A. B. Rendle.

A Correction.—In the report of the meeting of the Linnean Society (Journ. Bot. 1904, 390), the locality "Brent Down" should be "Brean Down." The mistake was Ray's in the beginning (in speaking of *Helianthemum polifolium*), and it has been copied by Smith, Withering, Dillenius, and others. Doubtless the confusion arose on account of the neighbouring parishes of East and South Brent, but there is also a parish of Brean, in which, of course, this outlying spur of carboniferous limestone stands.—H. S. Thompson.

NOTICES OF BOOKS.

Flora of Hampshire, including the Isle of Wight. New Edition, with numerous Additions. By Frederick Townsend, M.A., F.L.S., &c. Two plates and map. Demy 8vo, cloth, pp. xxxviii, 658. Price 21s. Lovell Reeve & Co.

Mr. Townsend, who has lately completed his eighty-first year, is to be congratulated on this second edition of the excellent local flora published more than twenty years ago, and then noticed at some length in this Journal (Journ. Bot. 1883, pp. 120–125) by Mr. Archer Briggs, himself the author of one of the best works of the same class. During these twenty years Mr. Townsend has continued to collect material, with the result that—exclusive of *Rubus*, the numbers of which have been more than doubled—

upwards of fifty new species have been added to the flora of Hampshire. The new edition—somewhat dear, perhaps—is in appearance a great improvement on its predecessor, the larger type employed rendering it more easy of consultation. Mr. Townsend acknowledges the help of numerous botanists in the preparation of the work, especially that of the Rev. E. S. Marshall, "in preparing for the press and in looking over proofs." We may perhaps say that this latter undertaking has been somewhat imperfectly fulfilled: on looking through the book our eye is continually arrested by wrong initials, not only of persons, but of plants—thus under *Rubus* we get "*A. Bloxamii*" and "*O. ochrodermis*"; well-known names appear as "Gildart" (p. 116), "Seeman" (p. xxx), "Matthews" (p. 283), "Mackreight" (p. 369), while others are initialled "*J.* Wulff" (p. 23 et passim), "F. *S.* Stratton" (p. 372), "*T.* Tucker" (p. 352), "E. S. Salmon" (p. xxx, where C. E. Salmon is clearly intended), "G. *L.* Druce" (p. 15), "W. H. Pugsley" (p. 658), and the like. Liss is spelt impartially "Liss" and "Lyss"; and certain abbreviations do not commend themselves—"rath." takes almost as much room as "rather," and nothing is gained by substituting "Guid." for "Guide." Some misprints are indeed carried over from the earlier issue, for in both we find *Cratægus* "*Oxycantha*" and *C.* "*oxycanthoides*."

The work as a whole was so fully noticed on its first appearance, and the Flora itself is so familiar to British botanists, that there is no need to give any account of its method. In many respects it is of the first order; the numerous critical notes, for example, have direct reference to the plants of the county; the casuals and doubtful records are placed at the end of each order—this plan is not always convenient, as it often separates members of the same genus—and are thus differentiated from the Flora proper, while only such of the former as present some features of permanence find a place. There is no disposition to include or to create varieties on the slender grounds which sometimes secure them a place in our books; and questions of nomenclature occupy no portion of the space. Under this latter head, indeed, we think Mr. Townsend might have gone further: there seems no gain in retaining "*Ranunculus hirsutus* Curt." if it is to be followed by "*R. Sardous* Crantz (earlier name)," and Sir Joseph Hooker's *Student's Flora*, excellent as it is in many ways, is hardly a satisfactory standard for nomenclature.

The interesting appendices which formed a feature in the first edition are here increased by three—on *Gentiana*, *Euphrasia*, and *Salicornia* respectively. The first summarizes Dr. Murbeck's divisions of *G. campestris* and *G. Amarella*; the second describes the Hampshire species in accordance with Mr. Townsend's monograph published in this Journal for 1897; the memoir on *Salicornia* occupies six pages, and will be of the greatest interest to British botanists, on whose behalf we are inclined to regret that it was not published in this Journal. Mr. Townsend adopts *S. herbacea* as a "collective species," under which he ranges eight—*S. stricta* Dumort., *S. procumbens* Sm., *S. ramosissima* Woods, *S. pusilla* Woods (with a new

var. *gracillima*), *S. intermedia* Woods, *S. appressa* Dumort., *S. radicans* Sm., *S. lignosa* Woods—the two last of which are perennial and the rest annual.

A few remarks occur to us on glancing through the book. *Helleborus occidentalis* Reut. takes the place of *H. viridis*—a change first indicated in the former edition of the work, where is a note "Should our plant be referred to *H. occidentalis* Reut.?" suggested by "some remarks of my valued friend, Rev. W. W. Newbould." The "pygmæan forms" described by Mr. Thorild Wulff in *Botanisk Notiser** (1896) are rightly regarded by Mr. Townsend as arrested growths due to soil and situation, and unworthy of separation from the type, even as forms. The *Rubi* "have been entirely remodelled and rewritten with the personal assistance of Mr. Moyle Rogers": they occupy nineteen pages. Under *Ludwigia* Mr. Townsend has overlooked Mr. Arthur Bennett's note in this Journal for 1903, p. 103, in which he shows that the earliest date of the refinding of the plant at Petersfield was 1830 (instead of "1835?"), and that it occurred there as recently as 1852 (Mr. Townsend's date of last finding is 1848). A more remarkable oversight is that of the list of Gilbert White's Selborne plants, printed, from his own indications in a copy of Hudson's *Flora Anglica*, in this Journal for 1893, pp. 289–294.

It must, however, be said that the author has left several uncertainties which it would not have been difficult to clear up. An example of this may be found in the record which has long appeared in our books as to the occurrence of *Pulmonaria virginica* in the Isle of Wight. This dates from the *Botanist's Guide* (1805), where the plant is localized:—"In the ruins of an old castle near Netley Abbey, far from any house, and apparently wild. *Rev. Norton Nicholls.* In a wood, through which the road passes, about two miles and a half from Newport, I. W. to Ride, as common as *Scilla nutans* in our woods. *Mr. Griffith*" (p. 314). Bromfield (Fl. Vect. p. 323) thinks the Isle of Wight record erroneous, and that it may be easily traced to the authors of the Bot. Guide inadvertently subjoining the then quite recent detection of *P. angustifolia* in this island, by Mr. Griffith, in 1804, to their announcement of the American species as being found near Southampton"; but adds that for the Netley station he has "seen specimens in the Banksian Herbarium, now in the British Museum." The first supposition is doubtless correct, but Bromfield himself has gone curiously astray as to the second; for the sheet in Herb. Banks bears the inscription "Hab^{t}. between Ride & Newport in the Isle of Wight in the greatest profusion. J. W. Griffith." This note, however, does not refer to the actual specimens on the sheet, which came from "Herb. Miller" and were probably cultivated, but to Griffith's memory of having seen the same plant in the locality; his note is followed by another, in Dawson Turner's hand, correcting the statement: "The plant in the places alluded to is *Pulm. angustifolia*. D. T." Mr. Townsend says:

* Mr. Townsend refers to Mr. Wulff's paper as a "pamphlet," but it was originally published in the magazine cited, pp. 53–64.

"The Rev. W. W. Newbould informs me he has seen, in Mr. Borrer's herbarium, a specimen of Mr. Griffith's plant, but it is not *P. virginica*." Mr. Hemsley has kindly looked this up for me, and writes, "The *Pulmonaria* in herb. Borrer. is *P. angustifolia*—'Whitefield Wood, nr. Brading, Aug. 1833'—all in Borrer's handwriting. In the General Herbarium is a specimen of the same species from the same locality from Bromfield; Griffith does not appear." It would seem, therefore, that none of the specimens attributed to Griffith were really collected by him, and that his identification of the plant which he saw in the woods with *P. virginica* was erroneous. There is at Kew a specimen of *P. virginica* from the Netley locality, collected in 1799.

Another example of a matter which might have been decided occurs on the same page of the *Flora*, where, under *Cynoglossum officinale*, we read: "Obs. There is a '*C. angustifolia* near Brading, I. of W., June 3, 1853; Jos. Woods' in Herb. at Kew." Mr. Sprague has examined the herbaria at Kew, but finds no plant collected by Woods either under *Cynoglossum* or *Pulmonaria*.

The page from which we are quoting (p. 325) also affords an example of inaccurate citation: "*Mertensia maritima* Don has been seen as 'a casual' on the half dry beach at Netley (Phyt. N. S. ii. 545) and hardly deserves notice here." The passage referred to runs, "The very rare Sea Gromwell (*Steinhammera maritima*) has been seen on the half dry beach just within reach of the salt spray, with the common yellow horned Poppy and the Sea Catchfly; it is a rare occurrence, and when it does occur only a solitary plant or so is met with." The article in which the passage occurs is unsigned—on internal evidence it may be attributed to Alexander Irvine; the "quotes" in the *Flora* were doubtless intended for the locality, as the words "a casual" do not appear; there was probably some mistake in identification, though the plant is not easily confused with anything else.

We are inclined to think that too much reliance has been placed on Mr. C. B. Clarke's Andover list, published in 1866, which supplied the text for an amusing if rather cruel review by H. C. Watson in this Journal for the following year. In some cases its plants are excluded as erroneous records, such as *Pimpinella major* (to which is attached a remarkable name, "Assise," probably a misprint for "Anise," which, however, has no connection with the plant—this and other slips, such as "Parsley Waterwort" for "Water Dropwort," are carried on from the first edition); but *Gnaphalium luteoalbum*, which Mr. Clarke only doubtfully determined from a solitary specimen, is retained, although Mr. Clarke's doubt is duly stated. Mr. Townsend notes his belief that Mr. Clarke considers *G. pilulare* "a good species"; on this head Mr. Fryer's note in this Journal for 1889 (p. 83) may be consulted. *Polygonum maculatum* is quoted as of Dyer and Trimen; the order of the names should be reversed.

It will be seen from what has been said that the new edition of the *Flora of Hampshire* is not above criticism; it is, however, an interesting and important contribution to the knowledge of our island botany, and may take rank with the best examples of its class.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on November 17th Lord Avebury gave a summary, illustrated by lantern-slides, of a paper "On the Shape of the Stems of Plants." He pointed out that while most plants had round stems, in some they were triangular, some quadrangular, &c., but that, so far as he knew, no attempt had been made to explain these differences. He thought they could, however, be accounted for on mechanical principles. In building, when the main object was to meet a strain in one direction, the well-known girder was the most economical disposition of material. In a tree-stem it was necessary to resist strain coming from all directions, and the woody tissues acted as a circular series of girders. In herbs with opposite leaves the strains were mainly in two directions, and were met by two opposite girders, thus giving the quadrangular stem. Taking our native flora, he showed that all herbs with quadrangular stems had opposite leaves, and as a rule herbs with opposite leaves had quadrangular stems. Sedges had triangular stems and grasses round stems, and while sedges had the leaves in threes, those of grasses were distichous. Pentagonal stems might be accounted for in a similar way, and incidentally this threw light on the petals of so many flowers. Thus we find in plants principles of construction which have gradually been worked out by the skill and science of our architects and engineers.

At the meeting of the Linnean Society on December 15th the sixteen ladies who had been proposed for election as Fellows were, with one exception, elected. The Society is to be congratulated on the forward step it has taken; many of the new Fellows will be an acquisition to its ranks, and are eminently worthy of the honour conferred upon them. This honour is, however, we think, seriously lessened by the addition of some whose only claim to admission to a learned society is the fact of their relationship to existing Fellows. It is greatly to be regretted that the Linnean Society has not some standard of admission more exacting than that of being "attached to the study" of some branch of natural science; in the cases to which we have referred the "attachment" would seem to be of the slightest. The botanists of the Society will welcome to their ranks Miss Margaret Benson, Miss Gulielma Lister, Miss Ethel Sargant, and Miss Annie Lorrain Smith.

We regret to learn that Sir Joseph Hooker has been compelled by advancing age to retire from the editorship of the *Botanical Magazine*, which he has carried on uninterruptedly for forty years. In the volumes for 1903 and 1904 Mr. Hemsley's name appears as assistant-editor, and it seemed natural to suppose that on Sir Joseph's retirement he would have been succeeded by Mr. Hemsley, who is in every way admirably fitted for the post, and whose help, we believe, has been given for a much longer period than the last two years. Messrs. Lovell Reeve and Co., however, announce that they "are privileged to report" that "the new (fourth) series to

begin this month will be begun under the auspices of Sir William Thiselton-Dyer, K.C.M.G., C.I.E., LL.D., Sc.D., F.R.S., Director of the Royal Botanic Gardens, Kew. Sir William's well-known high standing as a botanist, his interest in Horticulture, and his position at the Royal Botanic Gardens, Kew, with all the resources of that great establishment at his command, afford every possible guarantee that the high character of the Magazine will be well maintained, and, if possible, raised to a higher level of interest to the botanist and horticulturist, as well as to all lovers of the floral beauties of Nature."

Mr. Stanley Guiton has published, in a neat little shilling volume (West, Newman & Co.), some *Hints on Collecting and Preserving Plants*. The young botanist who follows out all the author's suggestions will incur a certain amount of unnecessary trouble, but he will turn out good specimens; and we could name certain veterans who (and whose correspondents) would greatly benefit by a course of lessons based on Mr. Guiton's instructions. At the same time we fear that the average beginner is likely to be deterred by the elaborations of some of the "plant" required; few, we are sure, will "get an asbestos gas-stove fitted up," or be in a position to obtain "an ordinary fire-place" fitted with gas and "asbestos fire-balls" for their special use. We imagine Mr. Guiton hails from the Channel Islands; nowhere else would "an afternoon's botanizing in the early spring" yield *Romulea Columnæ* as an ordinary gathering. We do not think the advice to arrange a British herbarium in accordance with Engler and Prantl's "Pflanzenfamilien" is at present in accordance with practical convenience; and, as the little volume is (incorrectly) dated "1905," Messrs. Groves's edition of Babington's Manual should have been mentioned as the most complete handbook of British plants. The book, however, is distinctly useful, and the worker will very soon modify its elaborate recommendations in accordance with practical experience.

The Devonshire County Council are taking steps to stop the practice of the wholesale stripping of wayside banks and hedges in order to supply wild plants and flowers for Covent Garden Market. Tons of ferns, primroses, daffodils, and other growths have been gathered and despatched to London during the past spring and summer. The County Council have passed a bye-law (which has to receive the confirmation of the Home Secretary), prohibiting this destruction, and persons offending in future will be liable to a penalty of £5 or a month's imprisonment. Special exception is made in the case of persons gathering flowers for pleasure or for the purpose of botanical study. This is very well as far as it goes, but it must be obvious to anyone who goes about the country with his eyes open, that the local authorities themselves are the greatest enemies of our native vegetation. In all the counties round London the hedges are mercilessly and quite unnecessarily clipped; the hedgebanks are scarified every year, and the native undergrowth is destroyed, to make room for nettles and other unsightly weeds which thrive under the new system and disfigure

our land; the grassy roadsides are every year more and more trenched upon, and, when allowed to remain, are used as dumping-grounds for road-scrapings. To make matters worse, the clippings and torn-up plants are in many cases not removed, but are left to wither where they have fallen, thus further disfiguring the already marred hedgebank. We are at a loss to understand how it is that the Selborne Society, which one would expect to be foremost in opposing mischief of this kind, has apparently taken no action in the matter, which, so far as we are aware, does not even receive due attention in *Nature Notes*, the Society's magazine.

Mr. W. H. Johnson, who has published a little volume on *The Cultivation and Preparation of Para Rubber* (Crosby Lockwood and Son), was, as he tells us on his title-page (!) "Commissioned by Government in 1902 to Visit Ceylon to Study the Methods employed there in the Cultivation and Preparation of Para Rubber and other Agricultural Staples for Market, with a view to introduce them into West Africa." In his preface, which dates from the "Royal Botanic Gardens, Kew, S.W."—Kew is *not* "S.W."—he tells us that his object is to give practical advice "to the continually increasing number of persons taking up Rubber cultivation"; he has supplemented his own observations by "frequent extracts" from other works, and the body of information brought together will doubtless be useful. But the book is about the dearest we have ever seen: 7s. 6d. (*net*) is a high price to pay for 99 pages of large print, with 12 of still more lavishly printed "prelims.," even when supplemented by six illustrations and a 64-page catalogue of the miscellaneous works of the same publishers.

The record of our native hepatic-flora is steadily increasing. The *London Catalogue of Mosses and Hepatics* in 1881 gave a total of 192 species of Hepaticæ, which rose to 220 in the Moss Exchange Club List in 1897, and now reaches 262 in the Rev. H. W. Lett's *Catalogue of British Hepatics* (Eastbourne: Sumfield, 1904, not priced). As compared with Lett's *Hepaticæ of the British Islands* (1902), the Catalogue appears to add four genera, eighteen species, and twelve varieties. One of the genera, *Geocalyx*, is new to the British flora; the other three, *Anastrepta*, *Jamesoniella*, and *Eremonotus*, are chips off older genera. *Mniopsis* and *Herberta* are transferred to positions to which they are better fitted. *Lejeunia serpyllifolia* is followed by two names, "*carifolia*" and "*heterophylla*," the former a synonym, the latter a species; in 1902 Lett rated them both as varieties of *L. serpyllifolia*. The rigorous suppression of all capitals in the specific names,—*e. g. holtii*, *dillenii*, *stableri*—is a mistake; but as to the usefulness of the catalogue as a whole there is no question.

A representative series of the ferns of North-west India, from the herbarium of the late C. W. Hope, including the types of his new species, has been presented to the British Museum by his son, Mr. Adrian J. R. Hope. This is a very valuable acquisition for the National Herbarium, for Mr. C. W. Hope had made himself the leading authority on the fern-flora of the district in question, and published a long and critical treatise—"The Ferns of North-Western India"—with thirty-five plates in vols. xii–xv of the

Journal of the Bombay Natural History Society, extending over the years 1899—1904. He there treats of 34 genera, containing 211 species; sixteen of the species are new, and nineteen others are figured because of their rarity or obscurity. Varieties Mr. Hope would not admit; he suppressed them if trivial, and raised them to specific rank "when distinct enough from the so-called types to be separately described and constant in character" (*op. cit.* xv., p. 417). Mr. Hope received numerous specimens from the following collectors:—E. W. Trotter, T. Bliss, J. F. Duthie, P. W. and V. A. Mackinnon, J. C. McDonnell, H. F. Blanford, R. W. Macleod, J. S. Gamble, and others.

"Appendix I. 1905," of the Kew *Bulletin*, containing a list of the seeds available for exchange with botanic gardens, appeared last month. The volumes for 1900, 1902–4, consist *solely* of appendices —surely a unique feature in periodical literature! The volume for 1901 still awaits completion.

The *Journal of the Kew Guild* for 1904 has for its frontispiece an excellent portrait of Mr. N. E. Brown, accompanied by a brief memoir. "Notoriety has no charm" for Mr. Brown—we imagine that the same might be said of most of those to whom the term is applied in its more usually accepted sense. The Journal contains interesting letters from "old Kewites" in various parts of the world, as well as obituary notices and portraits, including those of Walter Hill (1820–1904), formerly Colonial Botanist for Queensland, and William Lunt, who accompanied Theodore Bent on his exploring expedition to Hadramaut. Of the latter we read: "He died at St. Kitts, West Indies, on Jan. 3, 1904, after but three days' illness. He had kept up New Year's Eve at a friend's house."

Herr Georg Roth's *Die europäischen Laubmoose* (Band ii. Lief. 9, 10; Leipzig, 1904; pp. 385–640, tabb. xxxi.–l.) is now so far advanced that the publication of one more part will complete the work. The two parts recently issued contain the *Brachytheciaceæ*, *Amblystegiaceæ*, and *Hypnaceæ*. The author's method of figuring all the species is much to be recommended; but it is a pity that the figures are sometimes so scattered. For instance, the two species of *Bryhnia* have to be sought on plates xlii. and xxxix., and the three species of *Isothecium* on xxxvii., xlv., and lx.

The valuable herbarium presented by Prof. MacOwan in 1869 to the Trustees of Gill College, Somerset East, has been transferred to the Albany Museum, and will be incorporated with the already extensive collection existing there.

A few copies of the Second Supplement (1898–1902) to the *Biographical Index of British Botanists* will be issued in pamphlet form, price 1s. 6d., and may be had from the publishers of this Journal. The reprint contains additions and corrections to the list as originally printed in these pages.

We hope to begin next month the issue of a supplement to the second edition of *Topographical Botany*, which has been prepared by Mr. Arthur Bennett. It will contain the additional records up to the end of 1903.

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JAMES BRITTEN, K.S.G., F.L.S.

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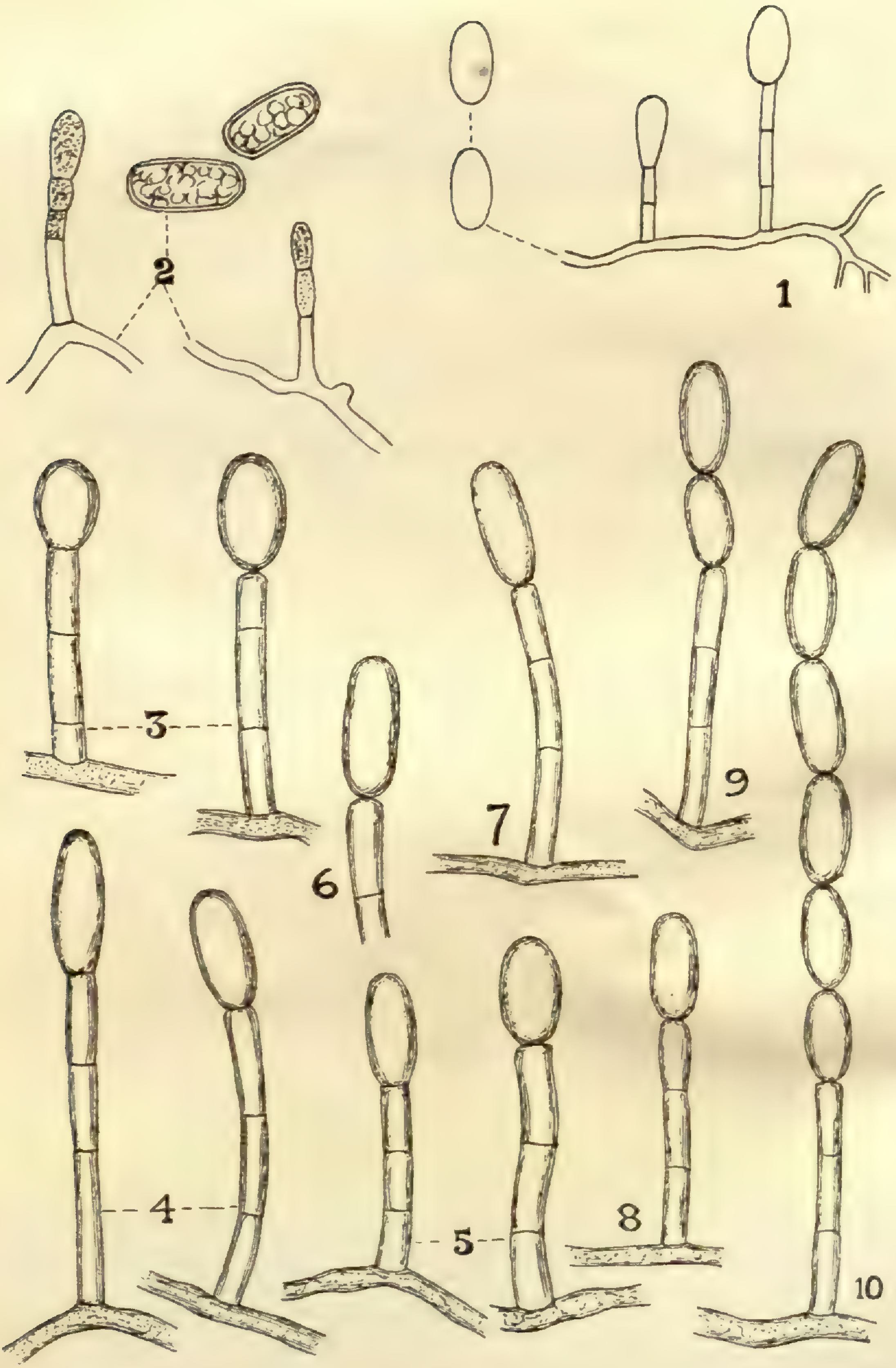

E. S. Salmon del. West, Newman proc.

CONIDIAL STAGE OF ERYSIPHEÆ.

ON TWO SUPPOSED SPECIES OF *OVULARIA*.

By Ernest S. Salmón, F.L.S.

(Plate 469.)

In 1861, in Rabenhorst's *Fungi europæi*, No. 300, the following name was published for a Hyphomycetous fungus:—"*Crocisporium fallax* Bonord. Spec. nov. Mspt. Hyphasmate tenuissimo effuso albo; sporis magnis ovato-oblongis (nonnullis cylindricis utrinque rotundatis); hyphis erectis septatis subcylindricis, apice sporas singulatim exserentibus; mycelio ramosissimo in superficie folior. repente. Hab. in foliis Viciarum, Guestphaliæ."

To the above diagnosis Bonorden added the following remarks:—"Der Pilz erscheint beim ersten Blick wie *Torula monil.* (*Acrosporium* Nees, *Oidium* aut.), wenn deren Sporen abgefallen sind, man findet aber niemals mehre Sporen kettenförmig verbunden, sondern immer nur eine an der Spitze der nach oben oft etwas dicker werdenden Hyphe."

In 1861 Bonorden gave a further account* of the fungus, remarking that it forms a delicate, flocculent, greyish-white layer on living leaves of peas and other plants, and that it resembles very closely the mildew *Torula monilioides*, but that it is quite distinct, since each conidiophore constantly bears only one spore—a character which seldom occurs in the mildews. Bonorden remarked further that the figures given by von Mohl† of *Oidium Tuckeri*, and those given by Preuss‡ of *O. leucoconium* show that these fungi are the same; and added that the appressoria (Haftorgane) noted by von Mohl on the mycelial hyphæ of *O. Tuckeri* had been observed by him also in the case of *C. fallax*. Bonorden mentions also that von Mohl stated that he observed that in the examples of *O. Tuckeri* seen by him in the spring of 1853 the conidiophores bore, almost without exception, a single spore at the apex, while the same fungus in the autumn of 1851 produced conidiophores which bore usually a chain of 2–3 spores. From this observation of von Mohl, Bonorden contended that the fungus found in 1851 was a true "*Torula* (*Oidium*)," but that the fungus seen in 1853 was his *C. fallax*. "Hiernach glaube ich nun das sogenannte *Oidium Tuckeri*, welche mit *O. leucoconium* Desmaz. übereinstimmt, richtiger *Crocysporium* zu nennen und zwar habe ich es *C. fallax* genannt, weil es seinem ganzen Habitus nach und auch beim ersten Blick unter dem Mikroskop sehr leicht für ein *Oidium* gehalten wird."

In the *Sylloge Fungorum* § (1886) Saccardo has kept up Bonorden's species, transferring it to the genus *Ovularia*.

An examination of Bonorden's plant shows at once that it is nothing more than the conidial stage of *Erysiphe Polygoni* DC., the species of powdery mildew so common on peas, vetches, &c.

---

* Bot. Zeit. xix. 201, 202 (1861).

† Ibid. xi. Taf. xi. (1853).

‡ Sturm, Deutschl. Flora, iii. Taf. 34.

§ Vol. iv. p. 141.

Before pointing out the characteristics of *E. Polygoni* in its conidial stage, and showing why under certain conditions it has been mistaken for an *Ovularia*, it will be well first to mention another fungus, lately published as *Ovularia Clematidis* Chittenden.* This fungus was collected at Chelmsford, Essex, in Sept. 1903, on the flowers of *Clematis Jackmanni*. The mycelium formed whitish patches on the upper surface of the petals. The following diagnosis is given :—"Spots epiphyllous, white, conspicuous, circular or subcircular, from 2–4 centimetres in diameter. Mycelium colourless, branched, creeping. Fertile hyphæ erect, simple, 40–60 $\mu \times 7\ \mu$, two or three times septate. Conidia hyaline, solitary or mostly so, cylindrical, with rounded ends, 28–42 × 14–16 μ, smooth.—This species differs from all described British species in the large conidia, which sometimes give indications of being shortly catenulate." Some of the figures given illustrating the fungus are reproduced at Plate 469, fig. 2.

Here again the fungus is clearly the conidial stage of *E. Polygoni*, a species which has been recorded on several members of the genus *Clematis*.†

On Plate 469, figs. 3–6, I have represented the conidial stage of *Erysiphe Polygoni* as it occurs on *Ranunculus*, *Pisum sativum*, and the cultivated white turnip. Quite similar forms of the conidial stage of *E. Polygoni* on *Anthriscus sylvestris*, *Heracleum Sphondylium*, and *Delphinium elatum* I have already figured in my "Supplementary Notes on the *Erysiphaceæ*."‡ I there remarked, "The conidiophores of *E. Polygoni* bear only a single conidium at the apex, unlike the *Oidium* form of many species of the *Erysiphaceæ*, where the conidia are concatenate in long chains." I should like here to call special attention to the fact that under certain conditions the conidiophores of some species of the *Erysiphaceæ* show only a single conidium being abstricted at their apex, instead of bearing the moniliform chain of conidia which is so characteristic of many species of the *Erysiphaceæ*. Recent study of the conidial stage has shown me that in the case of certain species the number of conidia borne by the conidiophore varies under different conditions. Thus, if examples of the *Oidium* occurring on *Euonymus japonicus*, gathered in the open, are examined, conidiophores will frequently be found which bear only a single ripe conidium, as shown at fig. 8; a careful search, however, will show some conidiophores bearing two ripe conidia (fig. 9). If, however, this *Oidium* is cultivated on leaves surrounded by a damp atmosphere, conidiophores bearing a chain of conidia, 3–6, or even more, in number, will be produced (fig. 10).

As regards *E. Polygoni*, the form on *Ranunculus* shows in the conidial stage conidiophores bearing frequently only a single ripe conidium at the apex (fig. 3); ripe conidia in chains of two or three

---

* Gardeners' Chronicle, xxxiv. 299 (1903). See also Journ. Roy. Hort. Soc. xxviii. p. clxxvii, fig. 176.

† See "Monograph of the *Erysiphaceæ*," p. 179 (Mem. Torrey Bot. Club, vol. ix. (1900)).

‡ Bull. Torrey Bot. Club, xxix. 187, pl. 9, figs. 1, 2, 8.

may, however, sometimes be found. On *Pisum sativum* examples may be collected in the field in which all the conidiophores bear each only a single conidium at the apex—the conidium is apparently mature, and becomes detached (fg. 4); when surrounded by damp air, however, the fungus produces chains of conidia, 2–4, or perhaps more, in number. On leaves of the cultivated white turnip the conidiophores often bear only a single conidium (figs. 5, 6), but sometimes two, three, or even four may be found in a chain. *E. taurica* Lév. apparently resembles *E. Polygoni* in producing conidia singly from the conidiophore. In *Microsphæra Berberidis* (DC.) Lév. the conidiophores bear often only a single conidium (fig. 7), although chains of conidia up to four in number may be found.

Returning to "*C. fallax*," it may be noted here that the conidia in the authentic specimen (Rabenh. Fung. Eur. No. 300) in the Kew Herbarium measure 28–40 × 14–16 μ, and vary in shape from elliptic-oblong to cylindric. In its size and variable shape the conidium agrees perfectly with that of *E. Polygoni*.* Bonorden remarked (see above) that his "*C. fallax*," on account of its conidiophores bearing only a single conidium, resembled *Oidium Tuckeri* as figured by von Mohl, and also *O. leucoconium* as figured by Preuss. I have personally observed that the conidiophores of *O. Tuckeri* sometimes bear only a single conidium, just as von Mohl has recorded and figured; sometimes, however, a chain of conidia, two to four or perhaps more in number, may be found. As regards *O. leucoconium*, it must be noted that Preuss, in the figure quoted by Bonorden, has represented, *not* the true *O. leucoconium* of Desmazières—which bears always very long chains of conidia†—but has given an excellent and faithful representation of the conidial stage of *E. Polygoni* on *Aquilegia vulgaris*.

The fungus sent out as *Ovularia fallax* (Bon.) Sacc. in Sydow, *Mycotheca Marchica*, No. 3080 (on *Vicia villosa*, Berlin, leg. P. Sydow), and No. 3393 (on *Vicia cassubica*, Berlin, leg. P. Sydow), and also in Vestergren, *Micromycetes Rar. Select.* No. 144 (on *Vicia villosa*, leg. Tycho Vestergren), is a true species of *Ovularia* (with globose or globose-ellipsoid conidia, 9 μ in diameter), and has nothing whatever to do with Bonorden's fungus.

With regard to "*Ovularia Clematidis*," the diagnostic characters given agree in every respect with those found in the conidial stage of *E. Polygoni*. The habitat of the fungus—the petals of *Clematis Jackmanni*—although somewhat unusual, is not without parallel. I have found an *Oidium* growing freely on the petals of a *Cineraria*, in a greenhouse; and Mr. Massee informs me that he has observed in the open the *Oidium* of *Erysiphe Cichoracearum* occurring on the flowers of the vegetable marrow.

Ovularia fallax, *O. Clematidis*, and *Oidium leucoconium* Preuss (non Desmaz.) are therefore to be placed as synonyms under *Erysiphe Polygoni*.

---

* See Bull. Torrey Bot. Club, xxix. 186, 187 (1902).

† See Ann. Sci. Nat. xvii. Pl. 6 A (1829).

EXPLANATION OF PLATE 469.

FIG. 1.—*Crocisporium fallax* Bonorden; two conidiophores and two mature conidia (copied from figures given in Rab. Fung. Eur.; No. 300).

FIG. 2.—*Ovularia Clematidis* Chittenden; two conidiophores; and two mature detached conidia, × 400 (copied from figures given in Gard. Chron. xxxiv. 299 (1903), and Journ. Roy. Hort. Soc. xxviii. p. clxxvii, fig. 176).

FIG. 3.—Conidial (*Oidium*) stage of *Erysiphe Polygoni* DC. on leaf of *Ranunculus* sp. (Cambridge, Sept. 1904), to left, immature conidiophore; to right, conidiophore abstricting ripe conidium; × 400.

FIG. 4.—The same on leaf of *Pisum sativum* (Telscombe Cliffs, near Newhaven, Sept. 1904), to left, immature conidiophore; to right, conidiophore abstricting ripe conidium; × 400.

FIGS. 5, 6.—The same on leaf of cultivated white turnip (Reigate, Sept. 1904), conidiophores and conidia; × 400.

FIG. 7.—Conidial (*Oidium*) stage of *Microsphæra Berberidis* on leaf of *Berberis vulgaris* (Cambridge, Aug. 1904); conidiophore with one ripe conidium; × 400.

FIGS. 8–10.—*Oidium* on leaf of *Euonymus japonicus* (Kew, May, 1904). 8. Conidiophore abstricting a single ripe conidium at its apex. 9. Ditto, with two ripe conidia at its apex. 10. A conidiophore bearing a chain of six ripe conidia (fungus cultivated in a damp atmosphere)—all × 400.

MR. EYLES'S RHODESIAN PLANTS.

THE Department of Botany has recently received a small but interesting series of flowering plants, part of a collection made in Southern Rhodesia, sent by Mr. Fred Eyles. Most of the plants come from the Matopo Hills; but some were collected at the Victoria Falls, on the Zambesi, and others near Buluwayo and in the country between Buluwayo and the Falls. Mr. Eyles hopes to be able in time to work the country more thoroughly. Descriptions of the novelties are appended, and also notes on some previously known species which are more or less of interest. As might be expected from its geographical position in Southern Tropical Africa, the flora of the district has affinities with those of both East and West Tropical Africa, as well as with that of South Africa.

Of special interest is *Englerastrum Schweinfurthii*, which Mr. Moore has identified from the rain-forest, Victoria Falls, and which was previously known from Bongo-land, in North Central Tropical Africa, and from Pungo Andongo, in Angola. Several of the Monocotyledons from the Matopo Hills mark an affinity between the various South Tropical African mountain floras. Such are *Burmannia bicolor* var. *africana*, *Ottelia vesiculata*, a *Vellozia*, and *Eriocaulon submersum*. The relationship to the Huilla mountain district of Angola is very striking. Other species, such as *Erlangea laxa* and *Habenaria malacophylla*, connect the East African flora with southern centres of distribution. The South African element is a strong one; we may refer especially to *Macropetalum Burchellii* and *Babiana Bainesii* as characteristic South African representatives.—A. B. R.

Polypetalæ.

By Edmund G. Baker, F.L.S.

Turræa Eylesii, sp. nov. Frutex ramulis demum glabris glaucis lenticellosis, foliis firmulis modice petiolatis ovato-lanceolatis vel rhomboideis basi cuneatis ad apicem attenuatis apice ipso acutis vel subobtusis utrinque glabriusculis nervis lateralibus subadscendentibus ante marginem anastomosantibus utrinque circiter 7–9, racemis brevissimis axillaribus floribus 2–3 congestis pedicellatis, calyce acute 5-dentato extus puberulo, petalis linearioblanceolatis quam tubo stamineo longioribus, tubo stamineo anguste cylindrico extus glabro apice acute 10-laciniato, ovario extus pubescenti circ. 8-loculari, stylo gracili pubescenti quam tubo stamineo longiori, stigmate ellipsoideo.

Hab. Matopo Hills. No. 29. "Large shrub among granite boulders. Flower cream-coloured. Alt. about 5000 ft."

Folia 4–5 cm. longa, 1·5–2·2 cm. lata. Petiolus 6–8 mm. longus. Petala ± 3·4 cm. longa, ± 4 mm. lata. Tubus stamineus 2·0–2·2 cm. longus. Antheræ oblongæ glabræ vix 2 mm. longæ apiculatæ.

This shrub has somewhat the aspect of *T. obtusifolia* Hochst. (Bot. Mag. t. 6267) and *T. mombassana* Hiern. It belongs also to the section *Euturræa*, and differs from the former by the ovary being generally 8-locular and pubescent externally, and by the leaves being unlobed; from the latter by the number of loculi in the ovary, and by the leaves not being crowded towards the ends of short branches.

Turræa obtusifolia Hochst. var. nov. matopensis. Frutex 6–8-pedalis ramis cinereis, foliis quam iis typi minoribus cuneato-oblanceolatis vel obovatis glabriusculis margine integris vel obsolete trilobatis racemis brevissimis paucifloris floribus modice pedunculatis, calyce extus glabro segmentis oblongis acutis quam iis typi longioribus recurvatis, petalis lineari-subspathulatis quam tubo stamineo longioribus, tubo cylindrico-obconico laciniis bifidis angustis, antheris 10 apiculatis, stylo breviuscule exserto glabro, stigmate subcylindrico.

Hab. Matopo Hills. No. 154. Shrub 6–8 ft., among granite rocks. Flowers white. Alt. 4500 ft.

Folia 1·5–1·8 cm. longa, summum 5–7 mm. lata. Petala 2·5–2·6 mm. longa, 4–5 mm. lata. Tubus stamineus 2·2–2·3 cm. longus. Antheræ ± 1 mm. longæ, glabræ.

This apparently comes between the type and var. *microphylla* DC.

Differs from the type in having smaller leaves less markedly trilobed, longer calycine lobes (2·0–2·5 mm. long), and rather shorter petals.

Cassia granitica, sp. nov. Arbor mediocris ramulis novellis puberulis vel fere glabris, foliis vulgo 6–7-jugis foliolis parvis oblongis vel ovato-oblongis apice acutis vel subobtusis basi cuneatis utrinque fere glabris vel sparse puberulis nervo medio superne impresso, petiolulis puberulis, petiolo communi gracili; racemis axillaribus brevibus, e ramulis juvenilibus oriundis, bracteis conspicuis usque

ad anthesin persistentibus lanceolatis, pedunculis strictis tenuibus, sepalis oblongis vel ovato-oblongis obtusis dorso pubescentibus, petalis aureo-luteis venosis obovatis vel oblongo-obovatis quam sepalis 2–3-plo longioribus, staminibus 3 inferioribus filamentis elongatis arcuatis medio nodoso-incrassatis 4 intermediis filamentis rectis multo brevioribus, 3 summis minoribus antheris cassis, ovario arcuato elongato cinereo-pubescenti, legumine ignoto.

Species *C. abbreviatæ* Oliver affinis.

Hab. South Rhodesia, near Buluwayo. No. 1080. Fair-sized tree, freely flowering. Golden-yellow flowers. On granite formation. Alt. 4469 ft. In flower September, 1902.

Folia 9–14·5 cm longa, foliola 2·0–2·5 cm. longa, 8 mm.–1·0 cm. lata. Pedunculi sæpissime 5·5–6·0 cm. longi. Calyx ± 1 cm. longus. Petala 2·0–2·3 cm. longa.

The following clavis shows the relation of *C. granitica* to the allied species :—

* Filamenta staminum majorum haud dilatata.

C. Sieberiana DC.

** Filamenta staminum majorum medio nodoso-incrassata.

α. Foliola ampla acute acuminata glabriuscula.

C. Arereh Del.

β. Foliola elliptica obtusa glabra (ex descript.).

C. Beareana Holmes (in Pharm. Journ. Jan. 18, 1902, p. 42).

γ. Foliola minora ovata vel ovali-oblonga sæpissime ± pubescentia.

C. abbreviata Oliver.

δ. Foliola minora oblonga vel ovato-oblonga demum glabriuscula vel glabra.

C. granitica, sp. nov.

*** Filamenta staminum majorum incrassata infra medium constricta.

C. Droogmansiana De Wild.

Baikiæa sp. No. 1122 is a specimen of a large forest tree, with mauve and purple flowers, growing on sandstone eighty miles north of Buluwayo. It is very closely allied to *Baikiæa plurijuga* Harms, collected on the Kunene-Sambesi Expedition at Kubango.

Combretum apiculatum Sonder, var. nov. parvifolium. Frutex ramis glabris cortice cinereo-lutescente instructis, foliis quam in typo minoribus ellipticis apice recurvo-apiculatis nervo medio superne impresso nerviis lateralibus utrinque 4–6 arcuato-adscendentibus supra glabris, spicis axillaribus modice pedunculatis quam foliis longioribus densifloris, floribus 4-meris, receptaculo superiore campanulato inferiore sparse piloso, disco piloso, calycis segmentis brevissimis acutis, petalis cuneato-obovatis ciliatis, staminibus quam petalis sub 4-plo longioribus, filamentis glabris, stylo tereti glabro, fructu ignoto.

Hab. South Rhodesia, near Buluwayo. No. 1094. On schists, large shrub. Flowers yellow. Alt. 4469 ft. In flower October, 1902.

Folia forsan juvenilia ± 2·0 cm. longa, 1·7–1·8 cm. lata. Spicæ

2·0–2·8 cm. longæ. Pedunculus 1·3–1·5 cm. longus. Receptaculum superius ± 3 mm. longum.

The type of *C. apiculatum* was collected by Drège at Macalisberg, No. 553.

Monopetalæ.

By Spencer le M. Moore, B.Sc., F.L.S.

Pavetta neurophylla, sp. nov. Fruticosa, glaberrima, ramulis robustis bene foliosis cortice cinereo obductis, foliis oblanceolatis obtusis sæpe breviter cuspidatis nonnunquam apice retusis basin versus in petiolum crassiusculum sensim attenuatis integerrimis coriaceis utrinque nitidis et eleganter reticulato-nervosis, stipulis cito evanidis ovatis obtusis, paniculis quam folia plane brevioribus laxis multifloris, floribus pentameris nunc sessilibus nunc pedunculis calyci æquilongis insidentibus, calycis tubo subsphæroideo limbo breviter lobato, corollæ tubo calycem totum 2½-plo excedente intus superne piloso-pubescente lobis tubum æquantibus vel fere æquantibus, filamentis ori affixis antheris linearibus breviter exsertis filamenta longe excedentibus, stylo longe exserto deorsum pubescente, stigmate anguste fusiformi integro.

Hab. Near Buluwayo, alt. 4469 ft. No. 1140.

Folia (petiolo exempto) 6·0–8·0 cm. long., ± 2·0 cm. lat., costulæ utrobique eminentes, arcte reticulatæ; petioli fere 1·5 cm. long. Stipulæ circa 0·4 cm. long. Paniculæ circa 5·0 cm. long. et diam. Calyx totus 0·2 cm. long., limbus vix 0·1 cm., hujus lobi 0·03 cm. deltoidei, obtusissimi. Flores lactei. Corollæ tubus 0·5 cm. long., 0·1 cm. lat.; lobi oblongi, obtusi, tandem recurvi. Filamenta 0·125 cm., antheræ 0·5 cm. long. Stylus circa 0·6 cm., stigma circa 0·4 cm. long.

On a first view somewhat like *P. edentula* Sond., which has larger and differently shaped leaves without the prominent reticulation, much longer pedicels, &c.

Pavetta Eylesii, sp. nov. Verisimiliter fruticosa ramulis robustis cortice pallido circumdatis ultimis maxime abbreviatis solummodo foliosis, foliis petiolatis rotundato-ovatis obtusissimis vel breviter cuspidulatis basi rotundatis margine undulatis supra minute puberulis subtus breviter griseo-pubescentibus in sicco fusco-olivaceis membranaceis, stipulis a basi latissima diuscule persistentibus ovatis acuminatis extus griseo-puberulis, paniculis brevibus laxis multifloris griseo-pubescentibus, floribus tetrameris pedicellis calycem sæpe excedentibus fultis, calycis tubo ovoideo ut limbus latus breviter lateque lobatus griseo-pubescente, corollæ tubo calycem totum 4-plo excedente extus glabro intus superne pubescente, lobis tubum semiæquantibus, filamentis ori insertis quam antheræ breviter exsertæ multo brevioribus, stylo longe exserto glabro, stigmate anguste fusiformi obscure 2-dentato.

Hab. Matopo Hills, alt. about 4500 ft. No. 1159.

Foliorum adultorum lamina 4·0–7·0 × 3·5–5·5 cm.; petioli 0·8–1·0 cm. long., supra breviter caniculati, griseo-pubescentes. Stipulæ circa 0·5 cm. long. Paniculæ 4·0–6·0 cm. long. et diam. Pedicelli adusque 0·4 cm. long. Flores albi. Calyx totus 0·2 cm. long.;

limbus 0·1 cm. long., ejusdemque lobi 0·04 cm. Corollæ tubus 0·8–0·9 cm. long., 0·1–0·15 cm. diam.; limbi lobi 0·4 cm. long., 0·2 cm. lat. Filamenta vix 0·1 cm., antheræ lineares 0·4 cm. long. Stylus 2·0 cm. leviter excedens; stigma crassiusculum, circa 0·2 cm. long.

A good deal like the last-described, so far as flowers are concerned, but quite different in leaf.

Emilia protracta, sp. nov. Herba prolixa, glabra, caule prostrato haud radicante fistuloso distanter folioso, foliis sessilibus breviter amplexicaulibus ovatis vel ovato-oblongis acutis basi aliquantulum cordatis margine undulato-denticulatis sæpe fere integris tenuiter membranaceis juvenilibus imminutis, capitulis fere 20-flosculosis sæpissime binis in corymbo paucicephalo digestis, capituli inferioris pedunculo proprio abbreviato superioris capitulum ipsum mox excedente, involucri subturbinati ecalyculati phyllis 7 inter se inæqualibus late vel anguste oblongis obtusis apice purpureis margine angustissime membranaceis, flosculis purpureis exsertis; styli ramis in appendice brevissima conoidea desinentibus, achæniis anguste cylindricis eminenter 10-costatis glabris quam pappi setæ albidæ scabridæ caducissimæ longioribus.

Hab. Victoria Falls, in and on margin of rain-forest, alt. 3000 ft. No. 119.

Folia 3·0–4·0 cm. long., 1·6–2·0 cm. lat., juniora vero 1·0–2·0 cm. × 0·4–0·8 cm.; costa centralis crassiusculus, inferne perspicuus; costulæ arcte reticulatæ sed parum aspectabiles. Corymbi circa 6·0 cm. long. Pedunculus proprius capituli inferioris crassiusculus, 0·3 cm. long; capituli superioris filiformis 0·8–1·5 cm. long. vel etiam longior. Involucrum 0·5–0·6 cm. long., 0·2–0·3 cm. lat.; hujus phylla majora 0·18–0·2 cm. lat., necnon minora 0·1–0·12 cm. Corollæ 0·5–0·6 cm., styli rami fere 0·1 cm., achænia 0·4 cm., pappi setæ 0·2 cm. long.

This is a curious plant with the habit and style-arms of *Emilia*, but unlike any other species known to me from its broad involucral leaves.

Strychnos matopensis, sp. nov. Fruticosa, ecirrosa, inermis, ramulis ultimis gracilibus bene foliosis griseo-pubescentibus, foliis parvis brevipetiolatis rotundato-ovatis brevissime cuspidulatis apice obtuse acutis basi maxime rotundatis 5-nervibus coriaceis glabris supra sublucentibus subtus pallidioribus, floribus parvulis subsessilibus in cymis terminalibus fulvo-tomentosis arcte aggregatis, bracteis minutis lanceolatis fulvo-tomentosis, calycis puberuli adusque ½ divisi lobis deltoideis obtusis, corollæ tubuloso-campanulatæ lobis 4–5 anguste ovato-oblongis quam tubus paullulum longioribus intus villosis, antheris 4–5 ovatis breviter apiculatis loculis basi villosulis, fructu ——.

Hab. Matopo Hills, about 4000 ft. No. 1182.

Foliorum lamina solemniter 1·5–2·0 cm. long. et 1·4–1·8 cm. lat. (accedunt autem folia minora modo 1·0 × 0·9 cm.); petioli 0·15–0·25 cm. long., griseo-pubescentes. Cymæ circa 1·0 cm. long. et diam. Bracteæ 0·15 cm. long. Calyx totus 0·15 cm., lobi 0·07 cm.

long., hi margine ciliolati. Corollæ tubus intus nudus, 0·175 cm. long.; lobi 0·23 cm. long. Antheræ subsessiles, 0·1 cm. long.

Known by the very small broad coriaceous leaves with broadly rotundate base, and the short cymes of small flowers.

Ilysanthes Plantaginella, sp. nov. Glabra, caule satis elongato erecto fere adusque apicem submerso infra medium dichotome diviso ceterum simplici magna pro parte nudo vel potius foliorum dilapsorum reliquiis maxime imminutis onusto, foliis ad apicem caulis confertis oblongo-obovatis obtusissimis basi leviter vaginantibus integris glabris crassiusculis viridibus vel rubro-purpureis, floribus ad normam generis magnis axillaribus solitariis, pedunculis quam folia brevioribus, calycis alte partiti lobis late oblongis obtusis imbricatis, corollæ tubo lato calycem bene excedente labio postico integro quam anticum magnum alte 3-lobum breviore, staminibus posticis breviter exsertis, staminodiis simplicibus incurvis crebro glandulosis paullo supra fauces affixis, capsula compressa oblongo-ovoidea calycem haud excedente.

Hab. Matopo Hills, Rhodesia, in streams running over granite. No. 47.

Planta fere 20·0 cm. alt. Caulis crassiusculus, 0·15 cm. diam. Folia ± 1·0 cm. long., 0·5–0·7 cm. lat., evanide nervosa. Pedunculi circa 0·7 cm. long. Flores (sec. cl. detectorem) punicei. Calycis lobi ægre 0·3 cm. long., 0·12 cm. lat., subtiliter 3-nervosi. Corollæ tubus 0·45 cm. long., basi 0·15 cm. sub limbo 0·35 cm. diam.; labium posticum deltoideo-ovatum, 0·4 cm. anticum circa 0·8 cm. long. Antherarum loculi 0·12 cm. long. Staminodia 0·2 cm. long. Stylus supra antheras breviter eminens. Capsula 0·3 cm. long., 0·25 cm. lat., glabra, stylo persistente crassiusculo sibi ipsi æquilongo coronata.

Aberrant from the genus in some respects—*viz.* the broad calyx-lobes, the entire upper lip of the corolla, and the unbranched staminodes, in this latter character resembling *Bonnaya*. The modern tendency being, however, to unite *Ilysanthes* and *Bonnaya*, and the present plant being intermediate between the two, I have, on Mr. Hiern's kindly given advice, decided to place it in *Ilysanthes*. A very distinct and pretty little plant.

Dr. Rendle gives me the following note:—

Ipomœa stenosiphon Hallier fil. With this species, from German East Africa, of which no authoritative specimen exists in this country, I have identified a plant collected on the Matopo Hills at 5000 ft. ("top of granite hill in crevasse," no. 58). Shortly after its description under *Ipomœa*, Dr. Hallier, as a result of the examination of a larger and more complete series of specimens, transferred the species to *Rivea*, as the type of a new section *Scyadenia* (see Jahrb. Hamb. Wiss. Anstalt. xvi. Beih. 3, 15). The gradual reduction in the number of seeds (3–1) by increasing abortion of the ovary-chambers, and the irregular dehiscence of the capsule suggested a reference to *Rivea*, sect. *Legendrea*, to which, in fact, one of the specimens had originally been referred by Dr. Hallier. But the long narrow corolla-tube, resembling that of *Ipomœa Bona-nox*, does not agree with the cha-

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racters of this section; and a further peculiarity is found in the presence of the fig-shaped glands which are profusely dotted over the lower leaf-surface, recalling one of the most striking characters of Dr. Hallier's genus *Stictocardia*. The author, in fact, regards his *Rivea stenosiphon* as intermediate between the two genera *Stictocardia* and *Rivea*. But in our opinion the affinity of this species is with the small set of large-flowered Ipomœas of the section *Eriospermum* (*I. marmorata*, *I. lapidosa*, and *I. longituba*), which are characterized, like the one in question, by a hypocrateriform corolla. The stigma is that typical of *Ipomœa*, and the reduction in the number of seeds associated with the irregular dehiscence of the brittle pericarp does not justify a separation from that genus. The plant is evidently very near *I. longituba* Hallier f., which I have not seen, but is distinguished by its more typically cordate leaves, rather longer corolla-tube, and exserted stamens and style.—A. B. R.

Barleria (§ Acanthoidea) **Eylesii**, sp. nov. Suffrutex spinosus, frequenter ramosus, strigose albo-pubescens, spinis numerosis debilibus patentibus folia excedentibus, foliis minimis lineari-lanceolatis apice spinuloso-acuminatis basi obtusis breviter petiolatis, racemis abbreviatis paucifloris vel etiam unifloris, bracteis spinis interpetiolaribus consimilibus, calycis lobis 2 externis inter se fere æqualibus late lanceolato-ovatis spinoso-acuminatis margine rarispinosis albis et fusconervosis, lobis internis anguste lineari-lanceolatis spinose acuminatis integris quam externi paullo brevioribus, corollæ dilute violaceæ extus subtiliter pubescentis tubo sursum leviter ac gradatim expanso limbi lobis subæqualibus oblongo-ovatis obtusissimis quam tubuus paullo brevioribus, staminibus breviter exsertis, staminodiis 2 minimis apice antheram minutam ferentibus, capsula ——.

Hab. Matopo Hills, among granite rocks at 5000 ft. No. 160.

Spinæ interpetiolares necnon bracteæ solemniter 1·0 cm. (vel paullulum minus) long. Calycis lobi externi 1·2 cm. et 1·5 cm. long.; lobi interni 0·8 cm. long. Corollæ tubus 2·3 cm. long., juxta basin 0·2 cm. diam., faucibus 0·6 cm.; limbus circa 2·0 cm. diam.; lobi 1·2 cm. × 0·6 cm. Ovarium ovoideum, 0·2 cm. long., 4-ovulatum. Stylus ima basi incrassatus ibique pubescens.

A plant looking much like *B. Holubii* C. B. Cl., but this, besides belonging to § *Prionitis*, has smaller and differently shaped corollas. It seems to stand nearest *B. bechuanensis* C. B. Cl., which, *inter alia*, has differently shaped corollas of a deep blue colour.

Orthosiphon (§ Exserti) **rhodesianus**, sp. nov. Herbaceus, ascendens, sursum ramosus, ramis obtuse angulatis pilosis, foliis sessilibus oblanceolato-oblongis obtusis integris vel margine distanter denticulatis fac. sup. cito puberulis fac. inf. griseo-pubescentibus, spicastris folia multo excedentibus pilosis, verticillastris solemniter 3–6-floris, bracteis obovatis obtusis coloratis alabastris obtegentibus deciduis, pedicellis quam calyx florescens brevioribus calyci fructificanti subæqualibus, calycis florescentis omnimodo viridis piloso-pubescentis lobo postico rotundato-ovato lobis reliquis setaceis lateralibus quam posticus brevioribus anticis eundem leviter exce-

dentibus, calyce fructificante nutante inflato scabriusculo, corollæ tubo calycem 1½-plo excedente recto labio postico 3-fido antico obovato concavo, antheris exsertis, stylo apice obtuso.

Hab. Deka Siding, South Rhodesia. No. 132.

Folia 2·0–3·5 cm. long., 0·3–0·7 cm. lat., membranacea, fac. sup. in sicco brunneo-virescentia, subtus grisea. Spicastra tandem fere 20·0 cm. long. Bracteæ 0·4 cm. × 0·2 cm., læte purpureæ, piloso-pubescentes. Pedicelli floris 0·2 cm. fructus 0·4 cm. long. Flores dilute violacei. Calyx floresc. intus nudus, totus 0·3 cm. long.; lobus posticus 0·1 cm. lobi antici 0·13 cm. long. Calyx fruct. in toto 0·6 cm. long., juxta medium 0·3 cm. ore 0·5 cm. diam.; lobus posticus patens, 0·25 cm. × 0·2 cm.; lobi antici leviter incurvi, 0·32 cm. long.; lobi laterales 0·2 cm. long. Corollæ tubus 0·5 cm. long.; labium posticum 0·12 cm. anticum 0·2 cm. long. Filamentorum pars exserta 0·22 cm. long.

Near *O. iodocalyx* Briq. and *O. breviflorus* Vatke. It can be recognized by the narrow sessile leaves, together with the small ovate purple deciduous bracts, exserted stamens, and inflated fruiting calyces.

Tinnea rhodesiana, sp. nov. Fruticulosa, crebro ramosa et foliosa, ramis teretibus cortice subcinereo obductis, ramulis gracillimis subtiliter pubescentibus, foliis parvulis oppositis vel suboppositis manifeste petiolatis ovatis vel ovato-lanceolatis obtuse acutis basi rotundatis fac. sup. glandulis microscopicis lucentibus præditis subtus glanduloso-pubescentibus, floribus parvis pedicellatis in axillis solitariis vel binis, pedunculis gracilibus nutantibus quam folia paullo brevioribus prope medium minute bracteolatis pubescentibus, calyce florescente infundibuliformi puberulo brevissime 2-lobo lobis rotundissimis, calyce fructifero parvo late ovoideo ore contracto decolori, corollæ tubo calycem ⅓-plo excedente superne leviter solummodo dilatato labio postico late obovato rotundato-truncato labii antici lobo intermedio emarginato quam laterales saltem duplo latiore, staminibus breviter exsertis, nuculis parvulis oblongis obtusissimis superne breviter setuliferis.

Hab. Matopo Hills. No. 159.

Foliorum lamina modice 1·0–1·4 cm. × 0·5–0·7 cm., tenuiter coriacea, in sicco viridi-brunnescens; petioli 0·3-0·4 cm. long., pubescentes. Pedicelli 0·5–0·6 cm. long.: horum bracteolæ setaceæ, summum 0·1 cm. long., sæpe vero breviores. Flores purpureo-brunnei. Calyx florescens 0·6 cm. long., 0·3 cm. lat.; fructescens 1·2 cm. long., vix totidem lat., hujus os modo 0·5 cm. lat. Corollæ tubus 1·0 cm. long., vel paullulum majus, ima basi 0·3 cm. faucibus 0·5 cm. diam.; labium posticum circa 0·2 cm. × 0·6 cm.; antici lobus intermedius 1·0 cm., lobi laterales 0·43 cm. lat. Filamenta uno latere pubescentia, longiora 0·9 cm., breviora 0·7 cm. long. Nuculæ vix 0·4 cm. long., superne (setis inclusis) 0·16 cm. lat.

Nearest *T. filipes* Bak., but quite different in leaf, among other points. The chief characteristics of the species are the very small and relatively broad leaves rotundate below, the long slender pedicels, infundibuliform calyx, small narrow-mouthed fruiting calyx, and exceedingly small achenes.

Apetalæ and Monocotyledons.

By Dr. A. B. Rendle.

Loranthus curviflorus Benth. Parasite on Mimosa thorn. Schist country, at 4469 ft. altitude, near Buluwayo ; No. 78. The leaves are broader than usual in the species, ranging from nearly $\frac{1}{3}$–$\frac{2}{3}$ in.; the flowers are also larger—a good 2 in. long. I find in Herb. Kew a similar plant, collected at Namasi, in British Central Africa, by Cameron. The breadth of the leaf is a very variable character in this species.

Euphorbia Eylesii, sp. nov. Herba glaberrima procumbens, caulibus dichotome et effuse ramosis, teretibus, rubescentibus, laxiter foliatis; foliis oppositis breviter petiolatis, e basi paullo inæquali linearibus, marginibus in sicco plus minus revolutis integris ; stipulis foliorum geminorum connatis et in processubus filiformibus sanguineis apice glanduliferis utrinque productis ; ramulis ultimis tenuibus, demum filiformibus, iterum dichotomis, et in cymis dichotomis, paucicyathiis terminantibus; cyathiis pedunculatis, turbinatis, plus minus sanguineo-purpurascentibus ; cyathii lobis inter glandulos parvis, triangularibus, acutis, albidis, margine ciliolatis ; glandulis luteis ellipticis, appendice alba, orbiculari-ovata præditis quæ in geminis alteris approximatis magna et conspicua est in alteris autem minore et sæpe pæne obsoletæ ; ovario glabro.

Described from a laxly branching shoot nearly 30 cm. long, the stem reaching 1·5 mm. in diameter at the base. Leaves deciduous, absent from the lower nodes, the lowest present barely reaching 2 cm. in length, including the petiole (less than 1 mm. long), and 1·5 mm. broad, a dull almost sage-green above, with a whitish under surface, diminishing to 2·5 mm. in the ultimate flowering branches. Cyathia 1·25 mm. long, and about as broad ; stalk to 2 mm. long ; larger appendages 1·5 mm. broad in two adjacent glands, much smaller and often reduced to a mere wing in the other two.

Hab. Deka Siding, between Buluwayo and the Victoria Falls. No. 130. May.

A member of the section *Anisophyllum*, approaching *E. Poggei* Pax (in Engl. Jahrb. xix. 118), which is a also a South Tropical African species, collected by Pogge on the Lulua River, in the Lunda district to the north of Rhodesia. Our species differs in its narrower blunt leaves, more diffuse habit, more shortly stalked cyathia, &c.

Burmannia bicolor var. africana Ridl. Granite country, Matopo Hills, at 5000 ft. altitude ; No. 52. This connects the two eastern and western localities from which the variety has been previously known. The plant was first collected in Angola, in the mountainous district of Huilla, by Welwitsch, but has since been found on the lower plateau north of Lake Nyassa by Thomson. Gosweiler has also recently collected it in the mountains of Northern Angola.

Ottelia vesiculata Ridl., another Huilla plant, was also found by Mr. Eyles on the Matopo Hills, at 5000 ft. ; No. 34. It has

hitherto been known only from the specimens collected by Welwitsch, who describes it as commonly occurring in slowly flowing streams and clear pools near Lopolo and Mumpulla.

Lissochilus Eylesii, sp. nov. Planta glabra e rhizomate crasso elata, foliis pluribus distichis e basi longius vaginante ensiformibus vel lineari-lanceolatis ad apicem acutum gradatim attenuatis; scapo laterali, in parte inferiore crasso et bracteis membranaceis obtusiusculis quam internodia brevioribus instructo; racemo elongato, multifloro, bracteis fertilibus oblongo-lanceolatis, acutiusculis, trinervibus, quam pedicelli brevioribus; floribus mediocribus, luteis; sepalo dorsali anguste obovato, 7-nervi, apice rotundo, sep. lateralibus spathulatis, obtusis, 7-nervibus, dorsali ¼-longioribus; petalis ovato-ellipticis, obtusis, multinervibus, sep. lateralibus vix brevioribus; labello pandurato, obtuso, basi lato in saccum obtusum terminante, vix calcarato, margine superne crispato, præcipue in lobo apicali qui labelli totius circa tertiam partem æquat, disco cum carinis tribus parallelis instructo; fructu ellipsoideo, basi et apice attenuato.

The specimen consists of a small portion of a stout rhizome bearing a tuft of leaves and a lateral scape. The stout leafy shoot bears at the base a rather long (about 10 cm.) broad abruptly acute membranous sheath, succeeded by a leaf with a short blade, the whole 22 cm. long, to which succeed the erect elongated leaves with ensiform blade, reaching about 55 cm. in length, with a breadth of 2·5 cm. The lower part of the hollow scape reaches 7 mm. in thickness; the raceme (over 30 cm. long) probably overtops the leaves. Fertile bracts diminishing upwards from 1·5 to about ·5 cm. long, spreading. Pedicels slender, about 1·5 cm. long. Flowers about 3 cm. long. Dorsal sepal 1·2 cm. long, and half as broad; lateral sepals 1·6 cm. long, ·5 cm. broad in the upper part. Petals 1·5 cm. long by nearly 1 cm. broad. Extreme length of lip about 1·7 cm., apical lobe about ·5 cm. broad. Pedicels recurving in fruit. Capsule exceeding 2·5 cm, long, about 1·2 cm. broad.

Hab. Matopo Hills, 5000 ft. Granite country, Feb. 1903. No. 150.

The species is most nearly allied to *L. Wilsoni* Rolfe, from Usongora, British East Africa; the flowers are very much alike in the two species; but those of *L. Wilsoni* are white and pink in colour, and the distal portion of the lip has a villous surface.

Habenaria malacophylla Reichenb. f. "In rain-forest, perpetual moisture," Victoria Falls. No. 92. The new locality for this species is of interest, as it serves to some extent to connect its centre of distribution in extra-tropical South-east Africa with the Nile-land locality—near a spring at Guida, in Eritrea, at 2900–3400 ft., where it was subsequently found by Schweinfurth.

Another example of the affinity between the various South Tropical African mountain floras is supplied by a *Vellozia* (No. 25), also from the granite country of the Matopo Hills, on sides of kloofs, at 5000 ft. Mr. Eyles's plant seems identical with the one

described as *Barbacenia Wentzeliana* by Harms (in Engl. Jahrb. xxx. 277), and collected by Goetze at Unyika, in the hill-country between Lakes Rukwa and Nyassa.

Ferraria Randii Rendle (in Journ. Bot. 1898, p. 144, sub *Morea*). Buluwayo. No. 158. Mr. Eyles sends this plant from the original locality. He describes the flowers as "dark purple mottled with yellow." It is very near *F. bechuanica* Baker, collected by Lugard in the Kalahari desert. *F. Randii* is, however, more floriferous; the flowers are larger and differently coloured. It is possible that a large series may connect the two species.

Babiana Bainesii Baker. No. 38 is a fine specimen of this plant from sandy soil in granite country, at 5000 ft., on the Matopo Hills. This brings the important South African genus *Babiana*, as well as the species in question, within the limits of the Tropical African flora. *B. Bainesii* is cited from numerous localities in the Transvaal.

Eriocaulon submersum Welw. An aquatic species from the granite country, Matopo Hills, at 5000 ft. (No. 65); previously known only from the hill-country of Huilla, where it was found by Welwitsch in several places.

E. subulatum N. E. Br. Victoria Falls; No. 125. An excellent specimen of this species, from top of cliff facing the Falls. The species was previously known only from the plant on which the species was based, collected at the same locality by Kirk.

NOTES ON LIMONIUM.

By C. E. Salmon, F.L.S.

IV.—Limonium humile Mill.

This is the name which the plant long known to European botanists as *Statice rariflora* Drej. or *S. bahusiensis* Fries should bear, as Mr. Britten has already pointed out in this Journal for 1901, p. 315. The original description in Miller's *Gardeners Dictionary*, ed. 8 (1768), reads: "4. *Limonium humile* foliis lanceolatis, caule humile patulo, spicis florum tenuioribus. Sea Lavender with spear-shaped leaves, a low spreading stalk and slender spikes of flowers. Limonium Anglicum minus, caulibus ramosioribus, floribus in spicis rarius sitis. Raii Hist. 217. . . . It was first discovered on the sea banks near Walton, in Essex, afterward near Malden in the same county, and since at the mouth of the river that runs from Chichester in Sussex"; in these localities it grows to this day. "The leaves of this sort are spear-shaped, about three inches long, and are broad in the middle, lessening gradually to both ends. The stalk rises four or five inches high, dividing into many spreading branches, which are very thick set with short spikes of whitish blue flowers. These appear in August, and the seeds ripen in November." A specimen in the National Herbarium from Miller's herbarium, named *Limonium humile*, is to be referred to *L. occidentale* O. K.,

but the description is clear as to what plant Miller had in view. "Branches thick set with short spikes" I think means that the *branches* are thick set (*i. e.* close together), and not that the *spikes* are dense.

In 1832, Fries (Mant. i. 10) applied the name *bahusiensis* to the distant-flowered form of the *S. Limonium*, "L. Suec. ii. 270": the other form, dense-flowered, he called *scanica*. The former he characterized (*l. c.* and Summa Scan. 1846, 200):—Leaves obovate-oblong mucronate at or *under* the apex, undulate, obsoletely punctate, veins inconspicuous, lamina decurrent into petiole; scape very much branched, *paniculate, angular*; spikes "*erecto-fastigiate*," more incurved than recurved, with distant flowers; calyx-teeth acute denticulate. The latter he described as possessing leaves elliptic-oblong, mucronate at the apex, very smooth, densely nigro-punctate, veined, distinctly petioled; scape terete, almost simple to the apex; spikes in a close corymb, strongly recurved, with imbricate flowers; calyx-teeth ovate acute.

An examination of living and dried specimens (including those in Fries's own herbarium) points to the conclusion that some of these "specific" distinctions are of little value.

For instance, in *both plants* the leaves vary in shape from a long elliptic-lanceolate form gradually tapering to the petiole to an obovate-oblong rather broad obtuse leaf distinctly petioled; one notices, however, that the *young* leaves of *L. humile* are narrower than those of *L. vulgare*, and are more often supplied with a mucro.

As regards the insertion of the mucro, I fear also that little value can be attached to this supposed distinctive feature, as leaves showing the mucro springing from both below and at the apex occasionally occur on the same plant.

The characters connected with the flatness, veining, and punctation of the leaves all appear of no specific value; the calyx-teeth of both species are not, I believe, denticulate, but those of *L. humile* often *appear* to be so, because the teeth are more plicate, and folds and irregularities occur in the margin of the lobes.

Drejer (Fl. Excurs. Hafniensis, 1838, 121) gave a short but interesting description of the two species; he compared, unfortunately, *L. vulgare* with only *diminutive* examples of *L. humile* (which he called "*variflora*"), and I may mention here (although I must refer to it again later) that Dr. L. M. Neuman, on examining Drejer's specimens, discovered that, besides a dwarf form of *L. humile*, he had in view (included under the name *S. variflora*) hybrids between *L. humile* and *L. vulgare*.

Drejer, however, added a further comparative character for our two species with respect to the bracts; these, in *L. humile*, he described as being obliquely truncate and muticous, with the outer broader embracing the inner, and all the bracts bearing flowers; in *L. vulgare* the bracts are acuminate-mucronate, with the outer narrower, and the lower ones are empty. He also noted the bright colouring of bracts and calyx in *L. humile*.

I do not think a hard-and-fast line can be applied to the shape of bracts, although in the *majority* of cases those of *humile* do

certainly appear to be blunter and possibly narrower than those of *vulgare*; but a very great deal of variation undoubtedly occurs.

Again, the lower sterile or empty bracts of *L. vulgare* are often most noticeable, and characteristic of that species; but examples occur of both species both with and without empty bracts.

In Boissier's description of *L. humile* (De Candolle, Prod. Sys. Nat. 1848, 644) he brings to light characters unnoticed previously —*viz.* the hairiness of the calyx-tube—"imâ basi piloso" in *L. humile*; "ad costas plus minusve piloso" in *L. vulgare*. Bracts more broadly herbaceous and flowers slightly larger are characters also given to distinguish the former from the latter.

The difference in hairiness of the calyx-tube is apparently a fairly reliable distinctive character, and in numbers of specimens examined the more glabrous calyx of *L. vulgare* was very noticeable. Dr. L. M. Neuman tells me that in Sweden it is a reliable feature of *L. vulgare* to have two to three of the calyx-ribs glabrous, whilst in *L. humile* all five are hairy. Unfortunately, this rule does not invariably hold good in Britain, for I have seen undoubted examples of the latter plant from Ireland (where *L. vulgare* is unrecorded, and hybridity consequently unlikely) with the calyx-tube almost entirely glabrous. I have been unable to confirm the other points mentioned by Boissier as helpful to distinguish the two species.

In Syme's *English Botany* (ed. iii. 1867, 163) it is mentioned that in *L. humile* the innermost bracteole is "half as long as" the intermediate one, whilst in *L. vulgare* it is twice as long. As the innermost bracteole (or bract) is *always longer* than the intermediate (or middle) in both species, I suspect a printer's error here, and suggest that the portion in inverted commas of the diagnosis referred to should read "half as long *again* as." Even then it cannot rank as a specific character, as it seems that the proportion between inner and middle bract is the same in both species—the former half as long again as the latter (varying slightly a little less or more). I have never seen, in either species, the inner bract *twice* as long.

Babington (Man. Brit. Bot. 1881, 293) placed some reliance upon the outer bract being keeled (in *humile*) or rounded (in *vulgare*) on the back, but these are characters I have been unable to find conclusive in the examination of fresh specimens.

Hooker (Stud. Fl. Brit. Is. 1884, 259) gave no fresh distinguishing features of the two, but evidently followed Syme.

Gillet and Magne (Nouv. Fl. Française, 1898, 406) pointed out that the inner bract is shorter in proportion to the outer in *L. humile* than in *vulgare*, and this statement I can confirm from the examination of many plants; in *humile* the inner bract is usually a good deal *less than twice* the length of the outer, whilst in *vulgare* it is often twice the length, or even more.

Lloyd (Fl. de l'Ouest de Fr. 1898, 283) contributed an observation upon the petals; in *humile* they are described as being "obtus, oblongs-en-coin"; in *vulgare*, "arrondis au sommet, entiers ou échancrés"; in the latter species he says the interior bract is three times longer than the exterior, a proportion I have never observed in any European examples. At Bosham and elsewhere I have noticed

that the petals of *humile* are always emarginate, whilst those of *vulgare* are either emarginate or entire.

In the Abbé Coste's *Flore de la France* (1904, 160) a capital and concise description is given of both *L. humile* and *L. vulgare*, but Lloyd's (*l. c.*) bract proportions are mentioned, which I believe to be incorrect. His description, "rameaux longuement nus à la base," is happily applied to *L. vulgare*, as opposed to the "rameaux garnis d'épillets presque dès la base" of *L. humile*.

Rouy's views as to the arrangement of our plants have been already given (p. 10), and in his paper no fresh points of distinction are noted between the two species under discussion. He states, however, that typical *S. bahusiensis* Fries (*L. humile*) has been wrongly reported from France, as the plant found there "is only the form *S. rariflora* Drej. (= *S. bahusiensis* Fr. var. *danica* Fries)." Now Drejer's *rariflora* has been already referred to as a name embracing both a small state of *L. humile* and the hybrid between that species and *L. vulgare*; of the latter I have not seen French examples, but specimens of the small state of *L. humile* exist in herbaria from that country, *as well as* examples of the normal-sized plant 10 or 12 in. high—hence I am not clear as to Rouy's remark concerning *L. humile* in France.

In the paper already referred to (Rev. Bot. Syst. 1904, 179) Rouy described a new subspecies, *S. remotiflora*, from Hérault (France) and Phalère (Greece). I have not seen type-specimens or figures of this, but from the description given judge it to be a large state of *L. humile*. Abbé Coste (*l. c.*) places *S. remotiflora* Rouy as a synonym of *L. humile*, and I am inclined to follow this arrangement until I have seen actual specimens: the latter plant has, however, never been recorded from Greece.

Let us now consider the varieties or forms of *L. humile* which have been observed.

E. Fries (Summ. Veg. Scan. i. 1846, 200) distinguished two varieties—*borealis*, a tall plant, 1–2 ft. high, much branched, with broad leaves mucronate *under* the apex, and spikes at length incurved; and *danica*, a small plant, a few inches high, sparingly branched, with narrow leaves mucronate *from* the apex, and spikes erect. The latter variety Fries identified with the "*rariflora*" of Drejer (*l. c.*), which Drejer himself admitted, some years earlier, differed from *borealis solely in size*.

An examination of fresh and dried plants—including type-specimens—leads one to the same conclusion as that reached by Drejer and Dr. L. M. Neuman (Bot. Not. 1883, 50); and one is driven to conclude that the various alleged differences in character of leaf, spike, &c., exist only on paper, and merge hopelessly one into the other in the living plant.

To complicate matters further, Drejer, as I mentioned previously, collected *two* plants under the name "*rariflora*"—a small state of *L. humile* (which Dr. Neuman has named f. *nana*), and a hybrid that has been dealt with already (Journ. Bot. 1904, 361). Dr. Neuman's very interesting paper in Bot. Not. 1897, 207, throws much light upon this point, and through the kindness of the

authorities at Copenhagen I have been able to see the actual specimens to which he refers in his paper, and to confirm his most careful observations.

To sum up, I may say that *L. humile*, when well marked, may be distinguished from *L. vulgare* at a glance by its long, often incurved, spikes, scattered spikelets, low-branched panicle, and beautiful purple colouring on bracts and calyx; this colouring can still be seen on the faded panicle, which, in *L. vulgare*, is greyish.

In my diagnosis I have added to the usual book-descriptions some distinctive characters as regards petals, styles, &c., as these seemed constant in numbers of growing plants examined; it would be satisfactory, however, if botanists could confirm these statements by observations made on plants growing in widely-spread localities.

The synonymy, description, and distribution in Europe of *L. humile* is as follows:—

LIMONIUM HUMILE Mill. Gard. Dict. No. 4 (1768) (non Herb.!).
L. Anglicum minus Ray Hist. iii. 247 (1706).
Statice Limonium Linn. Sp. Pl. ed. 1, 274 (1753) (pro parte).
S. Limonium Linn. Herb.!
S. Bahusiensis Fries! Nov. Fl. Suec. Mant. i. 10 (1832).
S. Bahusiensis Fries, var. *borealis* Fries! Sum. Veg. Scan. ii. 200 (1846).
S. Crouanii Lenorm.! ex Nym. Consp. 609 (1881).
Limonium rariflorum O. Kuntze, Rev. Gen. 396 (1891).
S. remotiflora Rouy, Rev. Bot. Sys. 179 (1904).

Scapus plerumque *ab imo* ramosus, irregulariter paniculatus; rami fere ad basin floriferi; spicæ erectæ, rectæ vel *flexuosæ*, vel *incurvatæ*; spiculæ *remotæ* (raro contiguæ); calyx *ad omnes costas* distincte et irregulariter *pilosus* (perraro fere glaber); costæ calycis *ad limborum apices productæ*; bractea interior plerumque exteriore haud duplo longior; styli staminibus *breviores*; petala emarginata.

Plant 3–20 in. high, glabrous. *Leaves* pinnately veined, very variable in shape, from obovate-oblong and rounded at the tip to elliptic-lanceolate and very acute at the apex, usually the latter, mucronate or not; young leaves narrower than those of *L. vulgare*, and usually apiculate. *Scape* rather slender, subangular, branched usually from the base or below the middle. *Branches* bearing flowers almost to their base, erect, erecto-patent or flexuous, often incurved, all flowering. *Branchlets* very rarely with empty bracts. *Spikes* long, erect or ascending-spreading, often incurved. *Spikelets* 1–2- (rarely 3-) flowered, arranged in two distant rows (rarely closer), with often the length of a spikelet between each. *Outer bract* 1–1⅛ lines long, usually tinged with purple, shape as in *L. vulgare*, but more often blunt. *Middle bract* 1½–2 lines long, longer than those of *vulgare*, otherwise similar. *Inner bract* 2¼–3 lines long, usually tinged with purple, shape as in *vulgare*, usually a good deal less than twice the length of outer bract, and half as long again as middle. *Bracteole* 1–2. *Calyx* 3–3½ lines long, usually strongly tinged with purple, distinctly and densely though irregularly hairy, including all veins (some only near base); rarely with a glabrous vein or whole calyx almost glabrous; veins strong and reaching usually to tip of lobes. *Styles* shorter than stamens. *Petals* emarginate.

L. HUMILE Mill. f. NANUM.

Statice rariflora Drejer! Fl. Excurs. Hafn. 121 (1838) (pro parte).
S. Bahusiensis Fries, var. *Danica* Fries! Sum. Veg. Scan. ii. 200 (1846) (pro parte).
S. Bahusiensis Fries, f. *nana* Neum. Sveriges Fl. 205 (1901).

Plant 3–6 in. high, more delicate in all its parts; branches almost simple and less flexuous.

Exsicc.—F. Schultz, Herb. Norm. nov. ser. Cent. 9, 897! Sherard in Hb. Oxford! Fries, Herb. Norm. fasc. iii. 18! Soc. Fl. Franco-helvet. 1901, 1228! Soc. Dauphin. 1882, 3431! 1896, 659! (latter includes f. *nanum*). Fries, Herb. Norm. fasc. xi. 26! (type and f. *nanum*). Reichb. Fl. Germ. Exsicc. 2200! (f. *nanum* and hybrid).

Distribution.—England! Scotland! Wales! Ireland! France N. and N.W.! Denmark! Norway! Sweden! ? Greece.

Distribution in Great Britain.—10. *Isle of Wight.* Wootton Creek! 1860, *Trimen* (*Herb. Brit. Mus.*). — 11. *Hants South.* Fareham! 1840, *Mrs. Robinson* (*Herb. Brit. Mus.*).— 13. *Sussex West.* Selsey! 1722, *Herb. Rand* (*Herb. Brit. Mus.*). — 15. *Kent East.* Near St. Margaret's Bay! 1840 (*Herb. Watson*). — 16. *Kent West.* *Syme, ex Top. Bot.*—18. *Essex South.* *Top. Bot.* A specimen from *Herb. Dale* (*Herb. Brit. Mus.*) labelled "On the left hand of the road from Haybridge to Maldon, 1722," may be in this division. — 19. *Essex North.* Walton! 1700, *Herb. Dale* (*Herb. Brit. Mus.*).—25. *Suffolk East.* *Top. Bot.*—? 27. *Norfolk East.* *Trimmer in Supp. Fl. Norf.* — 28. *Norfolk West.* *Top. Bot.* — 45. *Pembroke.* Pennar Water! 1851, *Herb. J. E. Smith.* — 48. *Merioneth.* Barmouth! 1867, *M. A. Lawson* (*Herb. Brit. Mus.*). — *52. *Anglesey*! 1884, *J. E. Griffith.*—*54. *Lincoln North.* Cleethorpes! 1879, *H. Searle* (*Herb. Brighton*). — *58. *Cheshire.* Bromboro' Pool! 1838 (*Herb. Edinburgh*). — 60. *Lancashire West.* Fleetwood! 1841 *Syme* (*Herb. Watson*). — 62. *York North-east.* *Top. Bot.* — 68. *Northumberland North.* "*Maclagan!*" *in Top. Bot.* — 69. *Westmoreland.* Barrow! 1854, *D. Oliver* (*Herb. Watson*). — 70. *Cumberland!* 1854, *T. C. Heysham* (*Herb. Watson*). — 72. *Dumfries.* Near Dumfries! 1873, *J. Sadler* (*Herb. Edinburgh*). — 73. *Kirkcudbright*! 1868, *Balfour* (*Herb. Edinburgh*).—74. *Wigtown.* Coast of Galloway! 1831, *Lloyd* (*Herb. Edinburgh*).

I have seen the form *nanum* from 13, 60, 69, and 72.

In Ireland *L. humile* is well distributed all round the coast; Sligo, Leitrim, and Londonderry appear to be the only counties from which it is not reported. Examples have been examined from ten Irish counties; some Galway, Down, and Waterford specimens seemed unusually close-spiked.

L. humile is seemingly unknown in the Channel Islands.

In preparing this and the two former "Notes," I must express my thanks for helpful correspondence and the loan of specimens to Dr. L. M. Neuman, of Sweden, and Prof. C. H. Ostenfeld, of Copenhagen. I am also greatly indebted to many other botanists for their kind assistance, and particularly to Mr. L. A. Boodle for translating reprints and articles bearing upon the subject.

THE LATE GEORGE BREBNER.

[George Brebner, who died at Bristol on the 23rd of December, in his fiftieth year, was born at Aberdeen, where he received his early education; this was carried on at Stuttgart, where he spent five years; he afterwards studied under Dr. Scott, who has kindly contributed the following account of his work at the Royal College of Science, and subsequently became lecturer on botany at University College, Bristol,—a post he held at the time of his death. He was also president of the University College Botanical Club; and his fellow botanists will greatly miss his great technical skill in microscopy and photography, which was always cheerfully placed at their service whenever asked for, in spite of the weariness and depression of the invalid's life he was compelled to lead.

The *Bristol Times and Mirror*, in announcing his death, said:—"Though never of a robust constitution, Mr. Brebner did not allow this to interfere with his work, and, despite the great handicap of frequent illnesses, which would have discouraged many a less indomitable spirit, he succeeded in bringing out numerous important papers, embodying the results of much patient and valuable original work. He was a great favourite with his students, who could not fail to appreciate the flashes of Scotch humour with which his lectures were often interspersed. He displayed a keen interest in all scientific matters, and was one of the leading spirits of the Bristol Naturalists' Society, at the meetings of which he frequently read most interesting papers. His kindly and genial presence will be sadly missed by a large circle of friends at University College, as well as by many others who were associated with him socially rather than professionally."—Ed. Journ. Bot.]

I have been asked by the Editor to contribute a few words on the scientific work of my former pupil and colleague, Mr. George Brebner. Mr. Brebner joined the Botany Class at the Royal College (then the Normal School) of Science, in 1888. He showed marked ability as a student, and having also considerable previous knowledge of Botany, made rapid progress. His cytological work was especially good; I still have a preparation of his showing the longitudinal fission of the chromosomes in the embryo-sac of *Fritillaria*, a phenomenon at that time by no means familiar in English laboratories. While still a member of the Advanced Class, Mr. Brebner was able to devote some of his time to research work, and the result was our joint paper on the anatomy and histogeny of *Strychnos*.* He stayed on at the Royal College as a research student, and we brought out two more papers in collaboration—on internal phloem in the root and stem of Dicotyledons,† and on the secondary tissues in certain Monocotyledons.‡ Mr. Brebner's co-operation was invaluable, his rare skill as a manipulator and draughtsman being only equalled by his good judgment in the interpretation of his observations.

* Ann. Bot, iii. 1889. † Ibid. v. 1891. ‡ Ibid, vii. 1893.

When the late Prof. W. C. Williamson and I were engaged on our joint "Further Observations on the Organization of the Fossil Plants of the Coal-measures,"* we were so fortunate as to to secure Mr. Brebner's services as artist; all the drawings in our three memoirs are from his hand. They are of remarkable beauty, and their merits have been widely recognized. Thus Count Solms-Laubach, in reviewing the third paper of the series, says: "Die Zeichnungen sind von Brebner's Meisterhand." †

Mr. Brebner was always too diffident of his own powers, and owing partly to this cause, partly to his uncertain health, his independent contributions to science were less numerous than his exceptional abilities would have led one to expect. As it is, however, they are of great value.

Mr. Brebner produced three important memoirs on the *Marattiaceæ*—one on the mucilage-canals, demonstrating their mode of origin,‡ another on the prothallus and embryo of *Danæa*,§ in which he first described these stages in the life-history for that genus, and the third on the anatomy of *Danæa* and other members of the family.‖ The last-mentioned paper, begun in the Jodrell Laboratory at Kew in 1893, and completed there, after many interruptions, in 1902, is a valuable contribution to the comparative anatomy of the more primitive vascular plants, a subject which English botanists have made peculiarly their own during the last few years. The work includes a general discussion—marked by characteristic caution—of the stelar theory; some of the new terms proposed in this connection by the author have met with wide acceptance. Mr. Brebner also did excellent work in Algology, spending some time at the Marine Biological Station at Cumbrae for the purpose of research. Some of his results are embodied in a paper on the origin of the filamentous thallus of *Dumontia filiformis*,¶ and in one on the classification of the *Tilopteridaceæ*,** which does much to clear up the remarkable life-history of these interesting seaweeds.

Mr. Brebner's death, when only in his fiftieth year, leaves a sad gap in the ranks of British botanists. As I have been closely associated with him, first as one of my ablest pupils and then as a valued colleague, I am glad to bear testimony to his worth as a single-minded and most skilful investigator.

D. H. Scott.

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* Phil. Trans. R. S., series B, 185 (1894) and 186 (1895).

† Bot. Zeitung, 1896, 2te Abth. p. 268.

‡ Journ. Linn. Soc. (Bot.) xxx. 1895.

§ Ann. Bot. x. 1896.

‖ Ibid. xvi. 1902.

¶ Journ. Linn. Soc. (Bot.) xxx. 1895.

** Bristol Naturalists' Society's Proceedings, viii. pt. ii. 1896–7.

SHORT NOTE.

Coast Œnotheras (p. 32).—It may be well to put on record the fact that both *Œnothera biennis* L. and *Œ. odorata* Jacq. are now well established on the coast of Somerset between Burnham and Brean Down, upon a stretch of sandhills very similar to that on the coast of Lancashire. *Œ. biennis*, introduced from America, has long been naturalized on the sandhiils and on the roadside between Burnham and Brean; indeed, it is quite a feature in the landscape. The first record of *Œ. biennis* on the Somerset coast appears to be in the Supplement to Watson's *New Botanists' Guide*, 1837, where it is mentioned by the Rev. J. C. Collins (the friend of Thomas Clark) as "naturalized on the sandhills between Burnham and Berrow for a mile or more." It now extends north of Burnham for five or six miles, and again on the south side of the town towards the mouth of the Brue. In regard to *Œ. odorata*, Mr. J. W. White mentions in his *Flora of the Bristol Coal-field*, 1887, *et seq.*, that it could not be found until a single specimen was seen on the sands at Berrow in 1883, though it occurred rarely north of Brean Down "on the sandhills between Weston-super-Mare and Uphill"; the Rev. R. P. Murray adds, in his *Flora of Somerset*, "and no doubt derived from neighbouring gardens." There are specimens of this Patagonian species in the herbarium of the late Thomas Clark, Jun. (now in my possession), which he gathered on the Burnham sandhills in 1859—this appears to be the first notice of the introduction of the plant in Somerset; and Mr. E. Clemmshaw told me he saw it near Brean Down in 1869 or 1870. In 1898 I observed *Œ. odorata* well established on the sandhills just north of Burnham—specimens were sent to the Watson Botanical Exchange Club—though to my knowledge it was extremely scarce during the previous fifteen years.—H. Stuart Thompson.

NOTICES OF BOOKS.

Flora of the County Dublin. By Nathaniel Colgan, M.R.I.A. Large 8vo, pp. 70, 324, with map. Price 10s. 6d. [12s. 6d.]. Dublin: Hodges, Figgis & Co.

When Hewett C. Watson, in 1832, issued his *Outlines of the Geographical Distribution of British Plants*, he inaugurated a new departure in plant-investigation. It was, however, many years before the new subject was followed up by the researches of other workers, and the local distribution of plants made a really scientific study.

While little has been added to the results of Watson's life-long work as far as England is concerned, the subject which absorbed his energies has been assiduously taken up by Irish botanists. The first edition of *Cybele Hibernica*, in 1866, bears witness to the new

interest in plant-investigation aroused by Watson's laborious compilation. A few Irish county floras then appeared, evidently influenced by the critical work in plant-distribution which was an important feature of the *Cybele Hibernica*. More recently we have had, in the second edition of *Cybele Hibernica*, and in Mr. Lloyd Praeger's *Irish Topographical Botany*, compendious works which really eclipse anything that Watson himself produced in the systematic topography of British plants.

Those who know something of the excellent work in Irish Botany already accomplished by Mr. Colgan will expect a good book from his pen, and their anticipations will be amply fulfilled. The work is inscribed to the memory of A. G. More, as the author justly says, "for a generation the foremost inspirer and guide of botanical research in Ireland." In a leaflet issued to prospective subscribers it is stated that:—"The aim of the present work is to exhibit in full detail the Ancient and Present State of the Dublin flora, if a convenient phrase may be borrowed from the title-pages of Smith's well-known county histories of Cork, Kerry, and Waterford. While doing full justice to the labours of the earlier workers, beginning with Caleb Threlkeld, whose *Synopsis* was published in 1727, the writer has endeavoured by a systematic personal survey of the county, spreading over a period of nine years, to ascertain the condition of its flora at the opening of the 20th century. The results of this survey, to be embodied in the forthcoming volume, prove beyond question that the metropolitan county is entitled, as a field for botanical study, to stand in the very first rank amongst Irish counties."

The ambitious scope of the flora of the county outlined in the above is fully justified; and we have an account of the plants of the metropolitan county of Ireland, which will serve as a model for future local floras to be undertaken by topographical botanists, such as was in a previous generation furnished by Trimen and Dyer's *Fl. of Middlesex* of thirty-six years ago. The bibliography, now a necessary adjunct to every local flora, is complete as far as it goes, which is only an indication to how great an extent the material for the present work has been supplied by the author's personal investigations and unflagging industry. The introduction, concisely and clearly written, affords an index to the considerable amount of original work especially undertaken in the prosecution of his studies for the Flora.

Special attention has been given to observation of the vertical range of plants, a useful feature almost entirely neglected in English county floras, with the exception of Lees's *Fl. of W. Yorkshire*, and White's *Fl. of Perthshire*. "Some thousands of aneroid observations, checked by the Ordnance Survey maps, have been made all through the mountain districts of the south, and the results obtained make it possible to distribute the county flora into vertical zones with a fair approach to finality." The highest point in county Dublin is Kippure mountain, the summit of which is 754·9 metres above sea-level, according to the most accurate observations. The following eight species are found in the county

at 720 metres and upwards:—*Rumex Acetosella*, *Galium saxatile*, *Vaccinium Vitis-Idæa*, *V. Myrtillus*, *Calluna vulgaris*, *Empetrum nigrum*, *Eriophorum vaginatum*, and *E. angustifolium*. On p. 96, however, the highest point there stated to be reached by *Galium saxatile* works out at 640 metres. In the mountains of Kerry, Mr. H. C. Hart records *Calluna vulgaris* at 1000 metres, the highest point reached by the species in the British Islands. In the Swiss Alps it gets up to 2000 metres.

On p. 130, Mr. Colgan gives the variety of this species, which is synonymous with *Erica ciliaris* Huds. (non L.), as "*var.* incana auct.," apparently following the *London Catalogue*, where it is quoted as "Calluna Erica *var.* incana auct." The obscure "auct." is *Reichb. Ic. fl. Germ. Helv.* xvii. p. 73, t. 1162, f. 3 (1855). An earlier and equally appropriate varietal name is *Calluna vulgaris* var. *pubescens* Koch, *Syn. fl. Germ. Helv.* p. 476 (1837). The Irish form, found, as it is, in localities exposed to the sea-breezes, is, I believe, the *forma Erikæ* of Asch. & Graebn. *Fl. N. O. Deutsch. Flachl.* p. 547 (1899), with broad flat leaves furrowed on both sides. The comparison of these British forms with specimens of local (?) continental varieties of well-known species is always an interesting piece of investigation.

The author, having carefully weighed the arguments for and against, has rightly relegated to an appendix the list of excluded species, casuals, aliens, &c. It is much better to separate from the body of a flora, for ready consultation, such a miscellaneous list. As he says, "It concentrates attention on the points where it is most needed; it suggests the direction in which the growth of the flora may be looked for."

A Supplement, also in concise form, gives the popular plant-names current in the county—the result of personal inquiries from house-to-house visits among the peasantry. Such an example is "heart's ease" applied to *Prunella vulgaris*, "given me by an old woman at Gollierstown on the Grand Canal." It is painstaking and methodical details such as this, met with everywhere throughout the book, which so enhance the value of Mr. Colgan's Flora as an original work. The present writer, with the object of even ferreting out some little flaw, has hunted here and there for misprints and typographical errors, with a signal lack of success, so carefully has the revising of proofs and the printing of the book been carried out. An unsympathetic Londoner would, however, fail to appreciate the value of interpolating in the index the Gaelic names of plants printed in Irish character, unless he were a student of native dialects.

Of the fruticose Rubi, twenty-five of the ninety-seven segregates listed as British have been recorded in Dublin county: probably others may be added with further investigation. In *Hieracium*, all the Dublin plants of *H. umbellatum* are to be referred to var. *coronopifolium*, well marked by its prominently toothed leaves, and so far not recorded for any other Irish county. *H. silvaticum* var. *maculosum* is recorded as having been found on railway-banks near Liffey Junction in 1903, but has nevertheless the appearance of an

introduction. I have only seen specimens from the West Riding of Yorkshire. *H. vulgatum* var. *sciaphilum* (if correctly named on p. 123) has also probably been only introduced by the railway.

To bring this notice to an end, it should be mentioned that the general get-up of the book is excellent, the printing clear with ample margins, the head-corner names carefully inserted, and a useful coloured map divided into botanical districts is added. All British botanists will congratulate the author on the admirable results of his nine years' work in the preparation of a model county flora.

FREDERIC N. WILLIAMS.

Index Kewensis Plantarum Phanerogamarum Supplementum Secundum Nomina et Synonyma omnium Generum et Specierum ab initio anni MDCCCXCVI *usque ad finem anni* MDCCCC *complectens ductu et consilio* W. T. THISELTON-DYER *confecerunt Herbarii Horti Regii Botanici Kewensis Curatores. Oxonii e Prelo Clarendoniano* MDCCCCIV. *Abama—Leucocoryne.* Price 12s. net.

THE value of Mr. B. D. Jackson's work on the *Index Kewensis* becomes more apparent when we compare it with that of those who have supplemented his undertaking. In the first supplement, in which he only collaborated, there was noticeable a larger proportion of errors of various kinds than in the original; in this second supplement, in which he has had no share, their number appears to have increased.

But posterity, reading the "monitum" to the present instalment, will be inclined to ask whether we are right in attributing to Mr. Jackson the lion's share in this most useful undertaking. This tells us that the *Index* "studio virorum apud Hortum Kewensem ipsum in rebus botanicis versatorum, necnon adiumento cl. J. D. Hooker et B. D. Jackson esset confectus et in usum publicum editus." It seems strange that the names of these "vires versatores" are not given; and that the "adiumentum" of Mr. Jackson should stand last in acknowledgement: surely this is a case where the last should be first? For, the Director of Kew notwithstanding, we prefer to adhere to the received account of the compilation of the work: that it was prepared by Mr. Jackson with the aid of a staff of clerks, none of whom were "in rebus botanicis versatorum," under the direction of Sir Joseph Hooker, who revised the manuscript, read the proofs, and was responsible for the geographical distribution—not the most satisfactory part of the book. When the *Index* appeared, we protested* against the lettering on the cover—"Hooker and Jackson"—as misleading and inaccurate; why Mr. Jackson's share in the matter should now be further minimized, we are at a loss to understand. We can only hope that the introduction intended by Mr. Jackson for the *Index* will in due time—perhaps with the too-long-delayed concluding part of the First Supplement—appear; such an introduction, as we have before remarked, is essential to

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* Journ. Bot. 1895, 346.

the right use and understanding of the work, of which we hope no false modesty will prevent Mr. Jackson from claiming his share.

The present Supplement, useful and indeed indispensable as it undoubtedly is, falls short of the standard attained by Mr. Jackson in the original work. We are not insensible to the appeal contained in the last sentence of Sir W. T. Thiselton-Dyer's preface; in an undertaking "tam laboriosus" mistakes must occur. But we feel that more care might and should have been exercised in the compilation, and we will justify our contention by a few examples.

We may have been exceptionally unfortunate, but, unless this is the case, there seems to be considerable carelessness in citation. For example, under *Cynosurus* we find *C. Cavara* and *C. macara*—if one has a large initial, so should the other; *C. ciliaris* Rottl., retained in roman type, should be in italics, and the synonym "= Eleusine aegyptiaca" should be added; *C. paniculatus* Roxb. (= Dinebra arabica), on the next page of the *Flora of British India* to that from which the former is cited, is omitted altogether, as are also *Dactylis cynosuroides* Koen. and *D. madraspatensis* Roxb. "Hybr.," which appears as a locality for two Centaureas, is intended to indicate that they are hybrids—are hybrids included in the plan of the work? and, if so, why is not the usual sign employed to distinguish them?

It might have been expected that the lines laid down in the original work and its first supplement would have been followed, especially when it is remembered how a similar sequence is observed in the *Flora Capensis*, at the expense of convenience. But we find "Tourn." given as the authority for the genus *Eryngium*, although both in the work and the first supplement the authority stands correctly as "[Tourn.] Linn."; "*Caltha*, Rupp." should similarly be "*Caltha* [Rupp.] Linn." The unhappy Kew innovation —contrary alike to custom, convenience, correctness, and commonsense—by which adjectival forms of proper names are spelt with a small initial is here for the first time introduced into the book. We note that the specific names, regardless of grammar, are quoted in the form in which they were originally published—see under *Amomum*, where we have *brachychilus*, *macroglossa*, and *paludosum*; this we think the better plan, but should not the Supplement follow the original work in such matters? If it were desired to introduce new features, the addition of the date of publication of the names—the omission of which is the one blot on the *Index*—would have afforded an opportunity for so doing. In this respect, however, the course pursued is absolutely retrograde, for whereas in the First Supplement such dates are given, in this Second Supplement they are omitted, even from magazines. Yet they are here even more important than in the original work, for, notwithstanding that the names included are stated to be those published 1896–1900, a large number of earlier names are cited, though we find nowhere any explanation of this. Such omissions from the volume should either be systematically included or altogether omitted; at present their inclusion appears purely a matter of chance. A reference to the numerous names cited under *Digitaria* from Willdenow, Persoon,

and other early authors seems to show that here (and no doubt elsewhere) a revision of the genus is attempted, many which in the body of the work were referred to *Panicum* being now retained in *Digitaria*; but it seems to us that this can only result in confusion, and it certainly should not be attempted without any warning of what is being done. An example of carelessness in proof-reading may be found on p. 2, where "Acetosella Rupp. = Rumex Linn. (Geraniac.)," is followed by two species, each of which is referred to *Oxalis*!

But the most serious defect of the Supplement lies in its omissions. We have not tested how other journals may have been examined, but, so far as the *Journal of Botany* is concerned, the work has been very perfunctory. For example, the transferences in Mr. Schlechter's "Revision of South African Asclepiadaceæ" (Journ. Bot. 1896–8) seem to have been overlooked; this means the omission of sixty-four names under *Asclepias* alone, to say nothing of those under other genera. Nor is this the only paper omitted; without any attempt at an exhaustive examination, we note the following, none of which find place in the Supplement:—

Aristea pauciflora Dod	Journ. Bot.	1900, 171
Asarum Shuttleworthii Britten & Baker f.	,,	1898, 98
Crassula Aitoni Britten & Baker f.	,,	1897, 480
,, Harveyi Britten & Baker f.	,,	,, 479
Crocodilodes Zeyheri S. Moore	,,	1900, 160
Detris fascicularis S. Moore	,,	,, 159
,, simulans S. Moore		
,, tenella S. Moore	,,	1899, 370
Epidendroides tetrandra Sol.	,,	1897, 192
Eriocaulon Brunonis Britten	,,	1900, 482
,, Koernickei Britten	,,	,, 481
Fagelia plantaginea S. Moore	,,	,, 461
Felicia barbata Schlechter	,,	1898, 375
,, natalensis Schlechter	,,	1897, 220
Impatiens taprobanica Hiern	,,	1900, 88
Indigofera Dyeri Britten	,,	1897, 453
Lasiostelma Gerrardi Schlechter	,,	1899, 62
,, longifolium Schlechter		
,, macropetalum Schlechter		
,, ramosissimum Schlechter		
,, subaphyllum Schlechter		

Many of these names are of course transferences, and liable to be overlooked by the casual reader; but it is strange that the "Curatores Herbarii Kewensis" who have been entrusted with this special work should not have taken note of them. We trust that *ex uno disce omnes* does not apply in this case, and that other periodicals have been more adequately treated.

It would not be difficult to find further material for criticism, but enough has been said to show that, indispensable as it is, this Second Supplement does not rise to the level of usefulness attained by Mr. Jackson in the original work.

Conspectus Floræ Græcæ auctore E. de Halácsy. Vol. iii., pp. 520 [Lentibulariaceæ—Isoetaceæ]; with Preface and Introduction to the whole work (pp. xxv). Lipsiæ: Engelmann. 1904. Crown 8vo.

All systematic botanists will congratulate Dr. von Halácsy in having brought to a conclusion his admirable Flora within a reasonable time. The first section was issued in the earlier part of 1900, and the final section of the third volume was issued in September last. The three volumes together extend to 1982 pages, including a separate index to each volume. It would have been convenient, perhaps, to have added a generic index to the whole work. A notice of the first and second volumes appeared in this Journal for 1902 (pp. 424–426); and what is said therein applies in every way to the third volume, so fully sustained throughout is the evenness and uniformity apparent in the work from first to last.

Greece and the Greek islands were included in the scope of Boissier's *Flora Orientalis*, but the material available for Boissier was small for this area in comparison with that utilized by the present author in the accomplishment of his work. The references, synonymy, and distribution are also much fuller, and the critical citations more exact, than in the *Flora Orientalis*. In other respects the new Greek Flora seems modelled on the classical *Prodromus Floræ Hispanicæ* of Willkomm and Lange. In the preface, inserted at the beginning of the last section, the author tersely explains the scope of his work, in a "forma Latini sermonis" not unlike that of Willkomm's own introductory preface, and therefore written in the most academical Latin. Dr. von Halácsy apologizes for utilizing in his Flora the Candollean arrangement of classification, not because it is phylogenetically sound, but on the plea of convenience, for the reason that it is generally used in European Floras, and the more readily enables comparisons to be made in consulting the *Flora Orientalis* and other works.

Boissier, as is known, somewhat obscured information as to distribution of species, in using in a broad sense the ancient Roman territorial names, which render almost useless the consultation of ordinary modern maps in working out the area of distribution, applying also ancient names (often of doubtful application) to modern Turkish and Greek districts and localities. The present author, in order to ensure uniformity in the correct citation of localities, accepts the authority of the local charts issued by the Vienna Institute of Military Geography, compiled in 1885.

Besides Greece and the Greek islands, the limits of the Flora include the province of Epirus and the island of Crete, stated in the introduction to be "under Turkish dominion"—though in the latter case it is scarcely correct, as Ottoman hegemony is no longer in the ascendant. The limits defined also apparently include the Thessalian eparchies ceded to Turkey after the war of 1897, previously comprised in the nomes of Trikkala and Larissa.

The references quoted for ordinal, tribal, and sectional names are carefully and exactly cited—in every case that has been tested

scrupulously accurate. This feature in the literary form of the work will be of use to compilers of other local floras, where such details are so frequently omitted.

Misprints are very few. "New Hell" as an alternative name for Australia is scarcely complimentary; and Mr. Cartwright's name as commemorated in a *Crocus* fares badly in its arrangement of consonants. The absence of critical comment and footnotes gives the work a compactness and neatness in literary form not seen in similar works.

The completion of such a Flora, begun under favourable auspices, carried through with uniform and sustained excellence, and involving a considerable amount of research and conscientious labour, must be as much a source of lively satisfaction to the capable botanist who has undertaken it, as it is a welcome addition to the list of classical European Floras, and a model for future works of similar scope.

F. N. Williams.

Abbildungen der in Deutschland u. den angrenzenden gebieten vorkommenden Grundformen der Orchideen-Arten. 60 Tafeln nach der Natur gemalt von Walter Müller mit beschriebenden Text von Dr. F. Kränzlin. Gr. 8vo. Berlin: Friedländer. 1904. **Price 10 Mark.**

This attractive volume should be of interest to British plant-lovers since, the greater including the less, it is also an account of our native orchids. The species are admirably represented by coloured drawings of the plant, natural size, with enlarged figures of the flower, and floral dissections showing lip, column, pollinia, sections of the ovary, and other characters, and in some cases fruit and seed. The artist has well expressed the habit of the plant, and much care has evidently been given to the preparation of the details; the series of plates as a whole is one of the best of its kind, both from an artistic and a scientific point of view. This is perhaps no more than we have a right to expect, from the association of the artist with so competent a worker on orchids as Dr. Kränzlin. In the page or more of text which accompanies each plate Dr. Kränzlin gives a clear general description of the plant, a short account of its distribution, and notes on points of interest in connection with pollination, special variability, and the like. The authors do not attempt a critical presentment of subspecies and varieties. For instance, *Orchis latifolia* is represented by a figure of a typical plant, and one of *O. incarnata* follows; the numerous forms which make the critical study, especially of the former species, one both of great interest and difficulty are merely referred to. The book in fact has somewhat of a popular character, but at the same time represents the highest type of such work; there is nothing slipshod about either plates or description, and those who have a difficulty with the language will find the volume well worth buying for the plates.

A. B. R.

Children's Wild Flowers: their Legends and Stories. By Mrs. J. Miller Maxwell; illustrated by Miss J. Maud Roxburgh. Demy 8vo, cloth, pp. 171. Price 7s. 6d. net. Edinburgh: D. Douglas.

The announcement of Mrs. Miller Maxwell's book led us to hope that we should find it one for which there is ample room—a book which should be popular and at the same time accurate, not only with regard to the botanical portion, but also as to its "folk-lore" portion. But we are once more disappointed; the volume, although attractively printed and pleasantly written, is no better and no worse than its predecessors.

As to its botany: "floret," which has an accepted significance, is used for small flowers—*e. g.* of Cranesbills (p. 67); rosebuds are called "budlets" (p. 105); we are told of *Anemone Pulsatilla* that "botanists scarcely admit its claim to be a *real* native, though it is found in abundance on all (!) the chalky downs of our south-eastern counties" (p. 9); the daffodil figured is certainly not typical *Narcissus Pseudo-narcissus*. We have the imaginary dedications to saints from "the old rhyme" for which T. Forster is mainly responsible, and without which no book of this kind is complete; misprints of botanical names—"*Gallium*" (p. 80); "*Carluna*" (p. 138)—these occur also in the index—and "*Lonicera caprifolium perfolium*" (p. 119)—this last Mrs. Maxwell says "is sufficiently familiar to own a folk-name, that of 'Goat-leaf'"; but "Goat-leaf" is a mere translation of *Caprifolium*, and has no claim to be considered a "folk-name." There are many invented names, and derivations which are ingenious rather than convincing; there is also that curious investing of plants with human attributes which has an irresistible attraction for the modern popular writer—*e. g.*, "Should help [in climbing] be churlishly refused, nothing daunted, and without a thought of resentment (!), the Rose falls back on itself" (p. 105); this reminds us of the remark appended, in the guide to a popular exhibition, to a picture of "Elephants Bathing"—"How much the elephants at the Zoo have given up for our sakes!" "Twamley" (p. 89) is not entitled to the possessive pronoun masculine. The plates by Miss J. Maud Roxburgh are not satisfactory specimens of colour-printing, nor is their drawing beyond reproach.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on 15th December, Dr. T. W. Woodhead read a paper entitled "The Œcology of Woodland Plants in the Neighbourhood of Huddersfield," of which the following is an abstract. The plant-associations of this portion of West Yorkshire having been dealt with on broad lines by Smith and Moss, I have endeavoured to carry the study a stage further by paying special attention to a very limited area. A small wood (Birks

Wood, near Huddersfield) was examined in great detail, and the main factors determining the distribution of the more important plants of the undergrowth studied, such as soil, shade produced by the dominant tree, moisture, exposure, and wind. The results thus obtained were then tested by an examination of the woodlands in an area of sixty-six square miles to the south and west of Huddersfield; special attention was also paid to the distribution of these species beyond the limits of the woodlands. Three distinct vegetation regions are found in this area:—(1) The Moss Moor, a part of the Pennines ranging in altitude from 1000 to 1700 feet. Here the conditions are extreme, and vegetation represented by very few species. *Vaccinium Myrtillus* on the higher ridges. *Eriophorum vaginātum* on deep ill-drained peat, the base of the peat containing extensive deposits of birch. The steeper slopes are clothed with xerophytic grasses, *Pteris aquilina*, ling, and bilberry. (2) Millstone-Grit Plateau, altitude 1000 to 500 feet; soil sandy, well-drained, in places covered by thin peat. Vegetation xerophytic, typically *Calluna* and its associates. Dominant tree oak, with birch and pine. (3) Coal-Measure Area, altitude 500 to 200 feet; soils over alternating shales, clays and sandstones, with much humus in parts, moisture more constant, conditions medium. Vegetation mesophytic, except on soils over sandstone where xerophytes extend from the Gritstone area. Passing from east to west the rainfall increases from 32 inches at the lower level of the Coal-Measure area to 45 inches on the Moss Moor. While certain species are restricted to one region, others occur in two or even three regions. These features of distribution were indicated on 6 in. to the mile survey maps, while maps on a much larger scale were used for separate woods. By this means the limits as well as the region of maximum development of each species were shown. Though the line of demarcation is often distinct between the regions, there is not unfrequently an overlap. Particular attention was paid to the transition regions, and it was shown that, as the mesophytes invaded the region of the xerophytes and came under the influence of drier and more rigorous conditions, they develop xerophytic characters. On the other hand, as the xerophytes encroach on the mesophytes and come under the mellowing influences of moisture and shade, they tend to lose xerophytic characters and take on mesophytic characters. The more pliable and adaptable a species is the wider its range of variation and distribution; the less pliable or adaptable species show a narrow range of structural variation and a more restricted distribution. Microscopic examination of the tissues showed striking modifications, and those specially dealt with were *Pteris aquilina*, leaf, leaf-stalk and rhizome; also leaves of *Scilla festalis*, *Deschampsia flexuosa*, *Holcus mollis*, *Vaccinium Myrtillus*, *Heracleum Sphondylium*, *Lamium Galeobdolon*, and *Mercurialis perennis*, each showing well-marked sun and shade, xerophytic and mesophytic structures according to environment.

Mr. R. Ll. Praeger sends us a reprint of the paper on "The Flora of Achill Island," which he contributed to *The Irish Naturalist*

for November and December last. It is an excellent example of what such a flora should be, giving, besides the list of names to which such a paper is too often limited, a full description of the physical features of the island, notes of the rarer plants and varieties, and a summary of previous (and evidently incomplete) investigations.

A CORRESPONDENT sends us the following cutting from the *Sussex Daily News* of Dec. 26, 1904, and expresses a natural curiosity to know how it was that the Natural History Museum failed to "secure the treasure." We can only say that the Museum now hears of it for the first time, and—so ignorant is the world of its greatest men—that the name of "the late Rev. H. Kirby" was also previously unknown to us, and finds no place in the *Biographical Index of British Botanists*.—"VALUABLE HERBARIUM: EASTBOURNE.—The Eastbourne Technical Institute is much to be congratulated on its good fortune in acquiring, through the generosity of Canon Goodwyn, the Vicar of Eastbourne, the herbarium collected and arranged by the late Rev. H. Kirby, sometime Vicar of Mayfield and grandfather of the present Vicar. Its scientific value is obvious from the first glance at its quarto pages, each containing a pressed specimen of some plant or flower, mounted with the most loving care and scrupulously ticketed with both its Latin and English names, the locality where found, and the precise date. Most of the collection dates from the first years of Queen Victoria's reign, but so carefully have the huge volumes been preserved, that the delicate contents with all the details of flowers, leaves, and roots; stamens, pistils, and petals might have been gathered last year. It is understood that the Natural History Museum at Kensington would very much have liked to have secured the treasure. Eagerness on the part of such judges must enhance the feeling of satisfaction that Eastbourne has retained it."

MR. FRANCIS BLACKWELL FORBES has presented to the National Herbarium his collection, containing over 4000 specimens. Mr. Forbes was associated with Mr. Hemsley in the "Enumeration of Chinese Plants" published in the *Journal of the Linnean Society*, and was, in fact, the originator of the scheme. When in China, Mr. Forbes compiled a list of the known flora, which, during his stay in England, he completed by the addition of rough lists of the named specimens from China in the National and Kew Herbaria, and an enumeration of all the Chinese plants recorded in botanical works. This was practically ready for publication in 1885, but was abandoned in favour of the larger work, the publication of which extended over eighteen years, and was completed in 1904. The Chinese plants of Mr. Forbes's herbarium, collected by Bretschneider and other botanists, and including his own collections, were retained in the National Herbarium for reference and inclusion in the Flora, and will now be generally accessible.

WE regret that, owing to illness in his family, Mr. Bennett has not been able to prepare an instalment of his Supplement to *Topographical Botany* in time for our present issue.

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THE

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Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

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GERMAN SIDE-LIGHTS ON SOME BRITISH RUBI.

By the Rev. E. S. Marshall, M.A., F.L.S.

Some years ago I reviewed in this Journal (1900, 25–8) an eccentric work on brambles by Dr. E. H. L. Krause; a pleasanter task now awaits me, my friend Dr. W. O. Focke having kindly forwarded a separate copy of his monograph of the Central European *Rubi*, in Ascherson & Graebner's *Synopsis*, vol. vi. 440–648 (1902–3). It need hardly be said that one finds evidence of careful study and wide knowledge on every page, the author's acquaintance with this most perplexing genus being unrivalled. The following extracts may prove serviceable to our batologists. It should be mentioned that, in addition to *Art* (species), Dr. Focke uses the following terms to express various grades of quasi-specific rank:—*Sammelart* (species collectiva), *Unterart* (subspecies), *Kleinart* (micro-species), *Rasse* (race), and *Abart* (? variety).

Rubus Chamæmorus L. This is wrongly accented on the penultimate syllable by both Hooker and Babington (*χαμαί, μόρον*).

R. hemistemon. The form of *R. plicatus* which has been so named in Britain appears to be var. *pseudo-hemistemon* Focke (1902) = *R. hemistemon* Genev., non P. J. Müller. "Stamens very short; leaflets narrow, with a long point, slightly hairy." *R. hemistemon* P. J. Müll. is now placed among the *Sprengeliani*; "not known for certain from England; but I have seen very similar forms from Hants and Merionethshire." Another plant which may be British is var. *macrander* Focke (1902). "Stamens exceeding the styles; petals narrow; leaflets with a slender point. Flowers sometimes white, sometimes pink." *R. Bertramii* G. Braun (classed, like *R. ammobius* and *R. opacus*, as a subsp. or micro-sp. of *plicatus*) differs mainly by having its outer lateral leaflets shortly stalked.

R. Rogersii Linton. This is now said to be "apparently not different" from *R. ammobius* Focke. When I first met with *Rogersii* (in 1891) I made it out to be *ammobius*, by comparison of the living plant with the description in Synopsis Rub. Germ.; but this was not accepted as correct by Rev. W. Moyle Rogers, nor (I think) by Dr. Focke himself. It may be well to quote from recent letters of Mr. Rogers:—"As to *R. Rogersii*, twice referred to *opacus* by Focke prior to 1894 (*vide* Journ. Bot. for that year, p. 213), Focke's note to me on the first specimens sent to him (of my collecting, Moreton-Hampstead, S. Dev., Aug. 1881) was, 'A curious form, intermediate between *R. plicatus*, *nitidus*, and *opacus*. The nearly sessile lateral leaflets recommend to put it under *R. plicatus*.' No reference to *R. ammobius* then, nor, so far as I know, until in this last publication . .; while in 1895 he wrote that he had seen no *R. ammobius* from Britain. . . . As regards *R. ammobius*, if *R. Rogersii* is not distinct from it, even as a var., it will of course be a good thing to clear away the latter name. Perhaps his new description of his plant covers it better than his account in Syn. R. G., which I find it hard to fit to the very constant British form. . . . I think our plant much

nearer to *fissus* than to *plicatus*, and that (contrary to p. 118 of Syn. R. G.) it has narrower leaflets and smaller flowers than *plicatus*; while 'acuto vel acuminato' seems, to say the least, a very misleading description of the terminal leaflet, which is so very marked and peculiar."

As *R. Rogersii* is one of the most marked British brambles, and no specimens of *R. ammobius* are accessible, I think it advisable to give the latest descriptions of both (Focke, 1902, and Rogers, 1900).

R. ammobius:—"Barren stems roundish and with slender prickles at the base, otherwise as in *R. plicatus*, but pale-green, often rather glaucous; prickles slightly recurved from a broad base, usually somewhat weaker than in *R. plicatus*. Leaves 5-nate; a few often 6-nate or 7-nate through division of the terminal leaflet. Petiole channelled on the upper side below the middle, with strong prickles. Leaflets often imbricate, plicate when young, then flat, *very finely, sharply and unevenly toothed*, pale-green above, glistening-white below with stellate felt and longer hairs when young, then greyish or dull-green. *Terminal leaflet broadly cordate-ovate*, acuminate. Inflorescence as in *R. plicatus*, but more leafy. Stamens rather exceeding the styles, upright after flowering. Fruiting calyx loosely reflexed. Fruits long remaining black-red."

R. Rogersii:—"St. nearly or quite glabrous, with crowded *stout-based prk.* (patent or declining), numerous sessile or subsessile glands and dark purplish pruinose tint in exposure. *L. rather small, frequently 6-nate*, rarely 7-nate, nearly plane, *with remarkably close, fine, even teeth* and long, very prickly, purplish petioles. *Lts. greyish-green*, strigose above, *very pale and softly felted beneath*: bas. sub-sessile; *term. ovate-acuminate-cordate, with long gradually tapering point*, and stalk about one-third its length. *Pan. with* several simple ovate-acuminate grey-felted l. above, and *crowded stout-based and chiefly falcate prk.* on rach. and ped., racemose or subracemose, short and truncate at first, often prolonged with distant alternate fl. later and racemose branches below. Stam. slightly exceeding the greenish stig. when the fl. are wide open. Frt.-sep. loosely reflexed. Young carp. hairy. . . . . Often strong in growth and rather tall, but with small and remarkably neat l., which recall those of *R. suberectus* in outline, though they are usually narrower, longer pointed, and far more hairy and greyish. Pet. white or pinkish, obovate or oval, of medium size."

R. INTEGRIBASIS P. J. Müll. is here ranked as a subspecies of *R. nitidus*.

R. ORTHOCLADOS A. Ley (1896), placed by Rogers among the *Vestiti*, is referred to Focke's subsection *Sub-Sprengeliani*, with the new name *R. euchloos*; as there is a previous *R. orthoclados* Boulay, *Ronces Vosges* (1869).

To R. RHAMNIFOLIUS are referred as races *R. Lindebergii* P. J. Müll. (of which *R. Münteri* Marsson is a synonym) and *R. stenoplos* Focke (1902) = *R. rhamnifolius* var. *stenoplos* Focke (1877). The latter is said to occur in England; it "differs from the type mainly in having long, slender prickles on the barren-stem and panicle." *R. pulcherrimus* is reckoned as a subsp. of *rhamnifolius*.

Our British R. ERYTHRINUS, the identity of which with Genevier's plant Dr. Focke inclines to doubt, is now named *R. argenteus* Wh. & N.; while *R. Lindleianus* (spelt "Lindleyanus") is considered to be a race of *R. vulgaris* Wh. & N. *R. Selmeri* is likewise placed as a subsp. of *R. vulgaris*; though the author adds: "The plant may be equally well assigned to *R. villicaulis* or to *R. vulgaris*; so that it may perhaps be treated as an independent intermediate species." This is probably the best solution; for several years I have thought it quite distinct from *villicaulis*, and to place it under the same aggregate with *Lindleianus* seems extremely far-fetched.

Of the five subspecies here grouped under R. THYRSOIDEUS Wimm. as a "species collectiva," *R. candicans* Whe. (doubtfully) and *R. fragrans* Focke are given as English, but not *R. thyrsanthus* Focke. *R. Gelertii* Frider. is included in Focke's section *Candicantes* as a micro-species, "intermediate between *R. candicans* and *R. radula*."

R. MACROACANTHOS Wh. & N. (1825), classed as a subsp. or near ally of *R. bifrons* Vest, has two forms assigned to it: A. *genuinus* Focke, from one station near Minden, and B. *sentus* Focke, from Jumet, in Belgium. The latter variety [Abart], here described (1902) for the first time, has been seen by the author from several English stations. For particulars the work itself should be consulted; my own very imperfect knowledge of the genus is entirely at fault.

Another "species collectiva," R. HEDYCARPUS Focke (1877), has three subspecies assigned to it, of which the first and third are British—viz. *R. macrostemon* Focke (1877) = *R. robustus* P. J. Müll. (1859), non Presl, and *R. Godroni* Lec. & Lam. (1847, "in part?") = *R. argentatus* P. J. Müll. (1859). It strikes me as being a somewhat cumbrous plan to invent a separate name for such aggregates; and it would surely have been better to keep up the name *argentatus*, so long as any doubt remained about the application of the name *Godroni*.

R. Bamingii Focke (1877) is a micro-species allied to *R. hedycarpus*; "I have seen dried specimens from Norfolk, in England, which I could not separate from dried *R. Bamingii*."

R. RHOMBIFOLIUS Whe., treated as a subsp. of *villicaulis* in Handb. Br. Rubi, p. 36, is allowed full specific rank in the present treatise; while *R. leucandrus* Focke is needlessly renamed *R. leucander*.

R. DANICUS Focke (written, *more germanico*, with a capital D), which Rogers makes a var. of *R. hirtifolius*, is here assigned as a subsp. to *R. macrophyllus*.

R. HESPERIUS Rogers "has somewhat broadly and more coarsely toothed leaflets, but is very like *R. myricæ*."

R. DREJERI subsp. LEYANUS Rogers receives the new name of subsp. *Augustini* Focke, as being too near in form to *R. Leyi* (here altered to "Leyii") Focke; this seems to me unnecessary.

R. MICANS once more changes its name (being the plant of Questier, but "apparently not of Gren. & Godr.") in favour of *R. hypoleucos* Lef. & Müll. (1859). *R. adscitus* Genev. was published in 1860.

"The name R. LEUCOSTACHYS has hitherto been an aggregate conception, under which in England, besides *R. vestitus*, *R. Godronii* in particular and the many connecting-links between *R. vestitus* on the one hand, *R. rusticanus* and other large species on the other, were understood. The name *R. leucostachys* has not been applied to a definitely circumscribed species; so that it cannot replace the name of *R. vestitus*." No doubt a similar objection could be brought against some of our other accepted names; and I suspect that British botanists will adhere to *leucostachys*, which has priority. *R. lasioclados* Focke is placed as a subsp. D. under *vestitus*.

R. GYMNOSTACHYS Genev., treated as a var. of *leucostachys* in Handb. Br. Rubi, is now considered by Dr. Focke to be a good species (with a subsp. *R. macrothyrsos* J. Lange), and placed between *R. pyramidalis* and *R. Boræanus*.

R. OBSCURUS Kalt. (1845), again, has full specific rank accorded to it, and is divided into two subspecies. The first, *R. insericatus* P. J. Müll. (1858), is identified with *R. Newbouldii* Bab. ("according to specimens from Rogers"). But *Newbouldii* is hardly the same as what Dr. Focke has named *obscurus* from England and Ireland—a very beautiful plant when fresh, which Rogers has considered as a subsp. of *R. fuscus*. I must own that I am completely puzzled. The second is *R. fusco-ater* Wh. & N. (altered to "fusci-ater"). Perhaps owing to lapses of memory, this and some other brambles usually acknowledged to be British are not admitted as such in the present work.

Among the "less important forms" allied to R. MENKEI Wh. & N. —itself divided into five races—is mentioned *R. propexus* Frider. (1887), which "can only be distinguished from the English *R. mollissimus* (as described by Rogers, Journ. Bot. 1894, 45) by its numerous glands." From my experience of *mollissimus*, I should have thought it referable to quite a different group; and Mr. Rogers now classes it under *R. hirtifolius*.

R. ECHINATUS Lindley (1829) is here displaced by *R. discerptus* P. J. Müll. on the ground of its being *nomen seminudum*, perhaps unnecessarily.

Under R. BABINGTONII occurs the following note:—"Rogers distinguishes *R. phyllothyrsos* as a separate variety. . . . It appears to me to be simply a question of local and individual variations." But a plant already recorded in 1900 for seven English and Welsh vice-counties seems hardly open to this objection.

R. MACROSTACHYS P. J. Müll., regarded as a var. of *R. fuscus* in Handb. Br. Rubi, is here treated as a good species (between *Babingtonii* and *scaber*), with a race, *R. indusiatus* Focke (1877), and a new subsp., *R. salebrosus* Focke; *R. tereticaulis* P. J. Müll., only known in Britain from Sprowston, Norfolk, and referred by Rogers to the *Bellardiani*, being assigned (as a subsp.) to *R. scaber*, and *R. fuscus* Wh. & N. (as a race) to *R. pallidus*.

R. UNCINATUS P. J. Müll., placed immediately before *R. Borreri* Bell Salt. by Rogers, is now considered by Focke to be a subsp. of it; and *R. Griffithianus* Rogers, separated by seven pages in the

Handbook, is referred as a race to *uncinatus*. *R. præruptorum* Bab. is said to "resemble *Griffithianus*, but does not belong to Boulay's Vosges plant of the same name, which is a form of the *R. Koehleri*-series." Objection is further taken to the name itself, as being too much like the Indian *R. Griffithi*; "but this plant will have been already described in France under some other name."

R. ANGLOSAXONICUS Gelert (1888) is definitely identified with *R. apiculatus* Wh. & N. (1825), and has allotted to it no less than five subspecies (besides several races); of these *R. podophyllus* P. J. Müll. is British, and possibly *R. erubescens* Wirtg. also. Such an unwieldy grouping of forms is somewhat formidable.

R. BADIUS Focke (1877). "England?—Dried plants appear to agree."

In Handb. Br. Rubi, R. HYSTRIX Wh. & N. is treated as a var. of *R. rosaceus*; here it is given as a valid species, with the remark: "In England forms which belong to this occur pretty freely; a closely related form, *R. infoecundus* [sic] Rogers . . . is well-marked there and in N. France, but true *R. hystrix* is variable in its characters." *R. adornatus* P. J. Müll., regarded as a subsp. of *hystrix*, is stated to be confined to Central Europe; but we seem to have the typical plant in W. Ireland, a slightly divergent form being not uncommon and pretty constant in England and Wales.

R. PLINTHOSTYLUS Genev. is placed as a red-styled variation of *R. Reuteri* Merc., which is itself ranked as one of the chief types (*Haupt-typen*) of *R. Koehleri*; *R. hostilis* Müll. & Wirtg.—not here mentioned as British, though Dr. Focke has so named some of our plants—being reckoned among half a dozen *Koehleri*-races which "require further study." *R. præruptorum* Boulay is said to resemble *hostilis*, "but seems to be a sterile hybrid." Another ally or subsp. of *Koehleri* is *R. apricus* Wimm. (1857); "I have seen dried specimens from England (Surrey) which quite agree with *R. apricus*."

R. PILOCARPUS Gremli (1870) is termed "a series of forms not yet sufficiently investigated, which manifestly falls into a number of geographically separated subspecies. The one which I know best is the very marked subspecies *R. Marshalli* . . . . with a very dense clothing of hair and very long needle-like prickles; it is not yet found within our area." *R. pilocarpus* has "drupelets with long hairs."

R. BLOXAMII Lees (1847) is now identified with *R. thyrsiflorus* Wh. & N. (1825) and with *R. rhenanus* P. J. Müll. (1858), and is classed among the *Glandulosi*; while *R. acutifrons* A. Ley (1893) is cited as a synonym of *R. humifusus* Wh. & N. (1825). Of *R. saxicolus* P. J. Müll. Dr. Focke writes:—"The series of forms of this micro-species is at present insufficiently examined, so that its limitation remains uncertain. Boulay omits it altogether; Rogers only includes it doubtfully; while Genevier ascribes to it a large distribution in Auvergne and the Pyrenees. Perhaps only a local variation of *R. humifusus*." *R. viridis* Kalt., though likewise classed as a micro-sp. under *humifusus*, is said to be "a collective species, embracing the forms which stand between *R. hirtus* and *R. macrophyllus*." In addition to *R. incultus* Wirtg., *R. flaccidifolius* P. J.

Müll. (given as a subsp. of *R. hirtus* in Handb. Br. Rubi) is here treated as a race of *viridis*: "very like *incultus*, except the prickles."

Among several quasi-species allied to R. HIRTUS (*i. e.* forms which are scarcely subspecies of it, but which seem insufficiently well-marked to take the rank of independent species), *R. rivularis* Wirtg. (not given as British) is separated by three pages from *R. serpens* Whe. Another of these quasi-species is *R. divexiramus* P. J. Müll., to a form of which *R. cavatifolius* P. J. Müll. is referred.

Our aggregate "R. DUMETORUM Whe." is split up into two main species, viz. *R. diversifolius* Lindley (= *myriacanthus* Focke), with *R. ferus* Focke (1902) = *R. ferox* Whe (1824) = *R. dumetorum* δ *ferox* Wh. & N. (1825) as one of its races, and *R. nemorosus* Hayne (1813) = *R. dumetorum* Whe. *pro parte*; each having several subspecies and races included under it.

In conclusion, I must apologize for the incompleteness of the above extracts; had full descriptions of the many important forms in question been quoted, this sketch would have run to an inordinate length. Unfortunately, none of our more accomplished bramble-students appear to know German; this must serve as my excuse for attempting a task for which my own comparatively slight and scrappy acquaintance with the British *Rubi* is decidedly inadequate.

P.S.—The following extracts from a recent letter of Dr. Focke may be of interest:—"Some months ago I resigned my post, so that I am again able to occupy myself with botany more than of late. . . . When treating *Rubus* in large botanical works, one is more or less obliged to employ methods of arrangement used for other genera; this was my case with regard to Ascherson & Graebner. I should like to arrange the *Rubi* once more, without any regard to preconceptions (das Bestimmen) or to the grouping usual in other genera. The one and only thing to be aimed at would be the nearest possible approach to Nature's truth. Perhaps I may soon make an attempt of this kind."

ASTER SEDIFOLIUS L. AND ITS VARIETIES.

By FREDERIC N. WILLIAMS, F.L.S.

I.

DURING the past autumn the examination of several specimens of *Aster sedifolius* growing in Kew Gardens, mostly between the T range and the Alpine garden, has afforded opportunity for comparing the characters from the living plant with those of other species of the section *Galatea*, also grown in the Gardens, such as *Aster canus*, *A. dahuricus*, and *A. trinervis*. Further examination and comparison of the ample material in the Herbarium has furnished the means for revising the varieties and forms included in the species, and for sifting, co-ordinating, and codifying the differential characters adduced for their discrimination, both from one another and from allied species.

De Candolle, in 1836, grouped the species of the section *Galatea* into two subsections on the presence or absence of punctiform glands on the leaves. As this differential character also conforms with the habit and with the stations affected by the several species of the two groups respectively, it is convenient to work upon, though it is not necessarily a salient mark of distinction among individual species in other genera. I cannot therefore agree with M. Georges Rouy, one of the able authors of the new *Flore de France*, in his reduction of *A. trinervis* to a mountain-form of *A. sedifolius*, on account of the absence of glands on the leaves of the former, and the less glandular character of *A. sedifolius* when ascending to a higher level. In Siberian specimens of the latter plant, found in colder latitudes, and at the level of 1000 metres, I have not noticed (in herbarium examples) this tendency of the leaves to become non-glandular.

At the outset, a list of the varieties and forms under the species may be given, as here proposed, to facilitate reference to their descriptions in the course of the paper. Previous authorities for the names of these varieties and forms, as under the present species, cannot, unfortunately, be cited, on account of the restoration of the earlier specific name of *A. sedifolius* L., Sp. Plant. ed. 1, in place of the later *A. acris* L., Sp. Plant. ed. 2, current in all floras. The currency of *A. acris* is due to the almost exclusive use of the second edition of the Linnean classic by working botanists until a comparatively recent date.

ASTER SEDIFOLIUS L., Sp. Plant. p. 874 (ed. 1, vol. ii. Aug. 1753).

α. *angustifolius.*
  f. *deflexa.*
β. *intermedius.*
  f. *communis.*
  f. *viscosa.*
  f. *monocephala.*
γ. *affinis.*
δ. *insculptus.*
ε. *squamosus.*
ζ. *pauciradiatus.*
θ. *dracunculoides.*
ι. *discoideus.*
  f. *scabra.*
  f. *floribunda.*
  f. *macilenta.*
  f. *Kewensis.*

SYNONYMY.

In the following alphabetical list the synonyms are, as far as comparison has enabled me to judge, applied to the separate varieties, and, to save repetition, only the varietal letter is given. When the synonym appears, by the context, or by examination of specimens, to apply to the species as a whole, no varietal letter is given. The references are given once and for all, and are not repeated in the descriptive portion of the paper.

Aster acer Rouy, Fl. de France, viii. p. 149 (Avr. 1903).
A. acris Bieb. Fl. Taur. Cauc. iii. p. 572 (1819) : = ε.
A. acris Cavan. Ic. Descr. Plant. Hisp. iii. p. 17, t. 233 (1795) : = β, f. 2.
A. acris S. G. Gmelin, Atlas, t. 38, f. 2 (1783) : = ι.
A. acris L. Sp. Plant. ed. 2, p. 1228 (vol. ii. Jul. 1763).
A. acris Reichb. Fl. Germ. excurs. i. p. 246 (1830) : = β, f. 1.
A. acris Willk. & Lge. Prodr. fl. Hisp. ii. p. 36 (1865) : = β, f. 1.
A. Barrelieri Pau, Not. Bot. fl. Española, iv. p. 43 (1891) : = β, f. 3.
A. bifidus Nees, Syn. Aster. p. 18 (1818) : = ι.
A. canescens Simk. (1882), non Pursh (1814) : = δ.
A. canus Baumg. Enum. Stirp. Transsilv. iii. p. 127 (1816), non Waldst. & Kit. (1802) : = δ.
A. deflexus Mönch, Meth. Pl. Marburg. suppl. p. 251 (1794).
A. dracunculoides Bess. Enum. Pl. Volh. Pod. Bess. p. 36 (1822) : = δ.
A. dracunculoides Eichw. Pl. nov. Casp. Cauc. obs. p. 1 (1831) : = ε.
A. dracunculoides Lamk. Encycl. Meth. Bot. i. p. 303 (1783) : = θ.
A. exaltatus Barth, Archiv, 1879 : = δ.
A. hyssopifolius Cavan. Ic. Descr. Plant. Hisp. iii. p. 17, t. 232 (1795), non Berg. (1767), nec L. (1767) : = β, f. 1.
A. lætus Fisch. ex Ledeb. Fl. Rossica, ii. p. 479 (1845) : = θ.
A. linifolius Güldenst. Reis. d. Russl. ii. p. 207 (1791), non L. (1753) : = θ.
A. punctatus E. D. Clarke, Travels, i. p. 601 (May, 1810), non Lapeyr. (1813) : = θ.
A. punctatus W. Sp. Plant. iii. p. 2022 (1800) : = δ.
A. punctatus Waldst. & Kit. Pl. Rar. Hung. ii. t. 109 (1805) : = δ.
A. strictus Wender. in Schrift. Gesell. Marburg. 1839, p. 54 : = θ.
Chrysocoma biflora L. Sp. Plant. p. 841 (1753) : = ι.
C. dracunculoides Lamk. Encycl. Meth. Bot. ii. p. 192 (1786) : = ι.
C. Linosyris Asso, Fl. Arrag. p. 46 (1779), non L. (1753) : = β.
C. Tatarica Less. in Linnæa, ix. p. 186 (1834) : = ι.
Crinita punctata Mönch, Meth. Pl. Marburg. p. 578 (1794) : = δ.
Crinitaria biflora Cassini, in Dict. Sc. Nat. xxxvii. p. 476 (1825) : = ι.
Galatea intermedia Cassini, in Dict. Sc. Nat. xviii. p. 58 (1820) : = β.
G. pauciflora Cassini, *l. c.* p. 56 : = θ.
G. punctata Cassini, *l. c.* p. 57 : = δ.
Galatella acris F. Schultz, Arch. Fl. p. 310 (1848).
G. biflora Nees, Gen. Sp. Aster. p. 159 (1832) : = ι.
G. desertorum Karel. & Kiril. in Bull. Soc. Nat. Mosc. xv. p. 376 (1842) : = θ.
G. dracunculoides Nees, Gen. Sp. Aster. p. 164 (1832) : = θ.
G. insculpta, Nees, *l. c.*, p. 162 : = δ.
G. intermedia Buek, Ind. ad Cand. Prodr. ii. p. 104 : = β.
G. pauciflora Nees, Syn. Aster. p. 164 (1832) : = θ.
G. punctata, Nees, *l. c.* p. 161.

G. punctata C. A. Mey. Verz. Pflanz. Cauc. p. 80 (1831) :=θ.
G. sedifolia Nyman, Consp. fl. Eur. p. 386 (1879).
Gelasia desertorum Less. in Linnæa, ix. p. 184 (1834) :=θ.
G. pauciflora Less. *l. c.* p. 169 :=θ.
Linosyris glabrata Lindl. ap. Cand. Prodr. v. p. 353 (1836) :=ι, f. 1.
L. punctata Cand. *l. c.* :=δ.
L. punctata Karel. & Kiril. in Bull. Soc. Nat. Mosc. xv. p. 378 (1842) :=ι, f. 1.
L. Tatarica C. A. Mey. in Bong. & Mey. Fl. Altaïca, suppl. 2, n. 136, ex Mém. Acad. Petersb. v. (1841) :=ι. [48 names.]

Homonymy.

The name of *A. sedifolius* has not been in use since the time of Linnæus, neither is it found in Floras. It last occurs in Syst. Nat. ed. 10, n. 11 (1759). The following list includes names under one or other of its synonyms which should be excluded from the species :—

Aster acris Lapeyr. Hist. abr. Pl. Pyren. p. 518 (1813) :=*A. salignus*.—This plant, though recorded from the Spanish Pyrenees (under a wrong name, however), and also from the department of Vosges by Besher, is not to be found in the more recent French or Spanish Floras, probably through oversight.
A. acris Leyss. Fl. Halens. p. 215 (ed. 2, 1783) :=*amellus*.
A. acris W. Sp. Plant. iii. p. 2023 (1800) :=*trinervis*.
A. acris var. *trinervis* Pers. Syn. Plant. p. 442 (1807) :=*trinervis*.
Galatella acris Nees, Gen. Sp. Aster. p. 171 (1832) :=*trinervis*.
G. punctata var. *davurica* Glehn=*davuricus*.
G. punctata var. *densiflora* Lallem. Ind. sem. hort. Petropolit. viii. sub n. 1238 (1841), et in Ledeb. Fl. Rossica, ii. p. 478 (1845) :=*paniculatus*.

Hybrid.

A. Albarracinensis Pau, Not. Bot. fl. Española, i. p. 9 (1887) :=*sedifolius* × *aragonensis* (*fide* Willk.).

The only verbal difference in the characters of *A. sedifolius* L. (1753) and *A. acris* L. (1763) is that in the first the leaves are stated to be "subcarnosis," and in the second the term "strictis" is substituted. Both terms are applicable. Additional synonyms are given for the later name.

II.

Aster, sect. Galatea, Cassini in Bull. Soc. Philom. p. 165 (1818).—Species perennes. Folia angusta. Calathia corymbosa. Periclinium hemisphæricum. Squamæ anthodii pluriseriatæ adpressæ, margine siccæ vel scariosæ, valde inæquales, sensim decrescentes. Flores radii sæpius plane neutri. Pappi pili inæquales, exterioribus brevibus. Stigmata cum stylo nulla vel rudimentaria. Achænia compressa oblonga, utrinque vel una facie uninervia, demum sæpe 4–5-gona.

Syn. *Galatea* Cassini in Dict. Sc. Nat. xviii. p. 56 (1820), non Salisb. (1812) sed absque char., nec Herb. (1820); *Galatella* Cassini in Dict. Sc. Nat. xxxvii. p. 463 (1825), Reichb. Consp. Reg. Veg. p. 108, n. 2553 (1828), Cand. Prodr. v. p. 255 (1836), Ledeb. Fl. Rossica, ii. p. 478 (1845), Nyman, Consp. Fl. Eur. p. 386 (1879); *Aster*, sect. *Galatella*, Benth. & Hook. f. Gen. Plant. ii. p. 273 (1873), Engl. & Prantl, Natürl. Pflanzenf. iv. abt. 5, p. 163 (1890), Rouy, Fl. de France, viii. p. 148.

Aster sedifolius L. Sp. Plant. p. 874 (ed. 1, vol. ii. Aug. 1753); Syst. Nat. ed. 10, n. 11 (vol. ii. Jun. 1759).

Puberulo-scabridus vel fere glaber, læte virens, 3–9 dcm. Radix lignescens. Caulis erectus foliosus striatus teres vel medium versus subangulatus, superne in ramulos corymboso-fastigiatos divaricatim multum divisus. Folia firma impresso-punctata integerrima, apice plusminus acuta, basi leviter obliquata, margine setulis consita. Bracteæ pedunculares lineares, sursum sensim minores, in squamas calathiales transeuntes. Anthodium campaniformi-hemisphæricum. Squamæ crassiusculæ carinatæ trinerviæ, plerumqne acutæ, margine minute denticulatæ vel subserrulatæ, externæ lanceolato-ovatæ virides, internæ oblongæ vel ovatæ et margine plusminus scariosæ, imæ uninerviæ. Ligulæ lilacinæ, anthodio duplo longiores etiam paullo ultra, disco flavo longiores. Fructus pilis adpressis albidis inspersi, pappum æquantes.

Geographical range. The species extends from the N.W. corner of Spain to Lake Baïkal, a distance of 5500 miles, and the width of the belt over the area of which it is found is not more than 1000 miles from north to south; being altogether within the north temperate zone of the Eurasian continent. The countries in which it is found include Spain, France, Italy, Hungary, Roumania, and Russia. The extreme limits of the species are here given:—

N. and E. Lake Baïkal, lat. 55°, long. 110° E:—Ledeb. Fl. Rossica, ii. p. 479 (1845), var. *discoideus*.

S. Sierra Nevada, in the prov. of Granada, Spain, at 1500 metres, lat. 37°:—A. Guirao, Pl. de Murcie, distributed in Bourgeau exs., var. *intermedius*.

W. Ferrol, in the prov. of Corunna, Spain, long. 8° 20′ W.:—Planellas-Giralt, Ensayo de una Flora fanerogamica Gallega (1852), var. *intermedius*.

α. *angustifolius*.—Folia omnia vere linearia uninervia acuta, inferiora 2 ctim., superiora $2\frac{1}{2}$ ctim.

Hab. France: Chartreuse Valbonne in the department of Ardèche, Montélimar in the department of Drôme, Sisteron and Digne in Basses-Alpes, and Vernet-les-Bains in Pyrénées-Orientales (f. *deflexa*, = *Galatella deflexa* Jord. & Fourr.).

This very narrow-leaved variety, which is the least common form of the species, seems to be limited to dry barren places in S.E. France. De Candolle gives Spain, France, and N. Italy as the distribution; but all the Spanish and Italian specimens I have seen have only the upper leaves 1-nerved, the lower and middle

leaves being 3-nerved, at least at the base, and belong to var. β. Willkomm's description certainly applies to var. β, and not to the narrow-leaved form. The only typical specimens of this form in Herb. Kew are from Gay's herbarium, dated 10th October, 1809, and were sent to him by Mons. Le Fort, of Geneva. That the specimens were gathered near Geneva is very improbable, as the extension of range is unlikely, and, as Mons. G. Beauverd, the editor of the *Boissier Bulletin*, informs me, the species has never been reported from any part of Switzerland, or from the French territory adjacent to Geneva, and is not noted in any Swiss flora. In the Herbaceous Ground in Kew Gardens there was a plant in full bloom in September, which exactly fits the description, and from which the leaf-measurements given above were taken. Exactly agreeing also with this plant is n. 423 of the set of dried plants issued through the Société Dauphinoise of Grenoble.

β. *intermedius*.—Folia omnia lanceolato-linearia, stricta, mucronata vel acuta, inferiora mediaque trinervia, saltem de basi ceterum subtrinervia. Corymbus 8–16 calathiorum. Bracteæ sæpe 4, supremâ anthodii squamas subtendente, sursum sensim minores. Squamæ anthodii internæ apicem versus dorso purpuranti-nigrescentes, imæ subcucullatæ. Ligulæ 10 (–12), abrupte in unguem exiguum contractæ, venis 4, 2 externis non marginantibus, 2 internis paullum crassioribus percursæ.—Folia inferiora 3½–5 ctim., superiora 2½ ctim. Squamæ circiter 20, 12 virides, 8 apicem versus purpuratæ. Ligulæ sæpius 10, 20 mm. long. (ungue virente 2 mm. incluso),—pappi pilis ad ligulam mediocrem circiter 30. Flores disci circiter 12,—pappi pilis ad flosculum mediocrem 108. Stylus cum brachiis 4½ mm. Specimina viva in Hort. Kew. culta 3–5 dcm.

Hab. Spain, France, and N. Italy, where its southern and western limits are those of the species as a whole as given above. According to Willkomm it is found throughout Spain, where it flowers from June to September. In France it is found in all of the seven departments of the Mediterranean coast, and also in Vaucluse, where it reaches no further north than Avignon (*Requien* in Herb. Kew.). In Herb. Kew. also there are specimens from Aude (1819), Montpellier (1828), and Cannes (*Perret*, 1811). Linnæus also gives Montpellier as a locality for the plant. In Italy it is limited to the coast of Liguria: on the Riviera di Ponente it is reported from Laigueglia and the heights above Genoa, and on the Riviera di Levante it is reported from Vernazza, Sarzana, and the Lunigiana hills (*Gibelli*, 1877, in Herb. Kew.). The Genoa station marks the northern limit of the plant in Europe.

Syn. (f. *communis*) *Aster acris* Reichb., Willk., *A. hyssopifolius* Cavan., *Chrysocoma Linosyris* Asso, *Galatea intermedia* Cassini, *Galatella intermedia* Buek, *G. punctata* var. *intermedia* Cand., *Aster acer* var. *intermedius* Rouy, Fl. de France, viii. p. 149.

f. *viscosa*.—Planta glanduloso-viscosa, squamis anthodii ovato-oblongis, serotina tempore florendi. Bracteæ plerumque 6. Ligulæ 8 (vel 6).

Hab. South of Spain: near Granada and Cadiar (*Boissier*),

near Montanejos and Valencia, Sierra den Garceran (*Cavanilles*), Sierra Nevada (*Guirao*).

Syn. *Aster acris* Cavan., *A. acris* var. *viscosus* Boiss., Voy. Bot. Espagne, ii. p. 300 (1839–1845).

The following note is translated from Boissier's account of the plant :—"The viscid substance which gives a shiny gloss to the leaves, and more thickly still invests the anthodia and the upper parts of the stems, gives the plant a peculiar appearance. I have only collected it with the buds scarcely opened, in its young state, although it grows in the midst of rocks exposed to the warmth, and in a region much lower than that of the typical form. Its peduncles are also provided with a greater number of scales or small floral leaves. When better known, possibly it may merit specific rank ; its much later flowering, at the end of September, would seem to indicate it, but I found it in too early a state of growth to pronounce a definite opinion. Cavanilles' figure, which I have cited, appears to me to represent the plant clearly, but in the description no reference is made to its viscid covering."

f. *monocephala*.—This is the plant found by Barrelier in the Murciau plain, and figured by him in his work, issued in 1714 posthumously by the elder Jussieu, under t. 605,—and thus distinguished from the common form of var. *intermedius*, which he figures under t. 606, and from which it differs only in its monocephalous stems, giving the plant a distinct and more strict and compact appearance.

Hab. West of Spain : Caparoso and El Sotillo in Navarre (*Casaviel'a*, Cat. Met. Plant. Navarra, in Anal. Soc. Esp. Hist. Nat. ix. [1880]), Albarracin in the prov. of Teruel (*Zapater*), Uña, Portapan, and Altura, in the prov. of Alicante (*Pau*, 1889).

In a part recently issued (April, 1903) of the sumptuous and beautifully illustrated *Icones ad Floram Europæ* of MM. Jordan and Fourreau (forming a section of vol. ii.), are included ten splendid plates of as many "species" of *Galatella*, with floral analyses on each plate, executed with consummate skill, and of the highest artistic merit, nos. 445–454, tt. 345–354, with Latin descriptions (pp. 48–50). Nine of these "species" seem to me to be variations of the common form of var. *intermedius*, difficult to separate from one another, while *Galatella deflexa*, n. 450, t. 350, with narrow one-nerved leaves, and more strict in habit than the other specimens figured, seems rather to come under var. *angustifolius*. To emphasize these trifling differences, Jordan's description is here given in a shortened form (eliminating characters common to this form and to the type of var. *angustifolius*) :— Calathia laxiuscula, sat grandia. Ligulæ plerumque 8–9, deflexæ. Flosculæ luteo-virentes, tandem luride purpureæ, laciniis acuminatis. Genitalia lutea. Pappus paullo rufescens. Anthodii squamæ inferiores acutiusculæ, supremæ acutiores. Folia deflexa acuta, paullisper acuminata ; surculorum erecto-patula, obtusa vel apiculo brevi soluta. The detailed floral analyses on each of the ten coloured plates are engraved with scientific clearness and precision, and are models of plant-illustration, but, even with the full-

size representation of the flowering stems, fail to carry conviction as to the reality of their specific differences.

γ. *affinis*.—Folia omnia lanceolata recta, mucronata vel acuta, eximie trinervia, sed multo minus punctata, punctis interdum (præcipue pagina superiore) paucis.

Hab. Notre-Dame du Cros, near Cannes, in the department of Aude, and probably elsewhere in S.E. France (*Magnier*, Fl. sel. exs. n. 1207).

Syn. *A. acer* var. *affinis* Rouy, Fl. de France, viii. p. 149.

δ. *insculptus*.—6–9 dcm. Caulis subangulatus, ima basi squamis aridis tectus, supra has squamas ibi purpurascens. Ramuli angulati in ramulos pedunculosque subdivisi. Folia primordialia vix 12 mm., oblongo-linearia 5-nervia subimpunctata. Folia caulina circiter 5 ctim., lineari-oblonga vel late lanceolata, distincte trinervia, basi torta hinc oblique patentia, apice modice attenuata in mucronem concavum contracta, punctis glanduliferis in superioribus sursum sensim increscentibus. Corymbus 7–14 ctim. diam. Pedunculi incrassati subangulati, firmiores quam in *var.* θ, paucibracteatæ vel interdum subnudæ. Squamæ anthodii inferiores acutiusculæ, interiores obtusæ coloratæ. Ligulæ 9–12. Discus multiflorus. Semen fuscum.

Hab. Hungary, Roumania, and Russia.—Hungary: (*Sadler & Pauer*, 1825, in Herb. Kew.), stony pastures in the neighbourhood of Samobor in Croatia, the western limit of the plant (*Klinggraeff*, ex Schloss. & Vukot. Fl. Croatica, 1869, p. 785); Feryssarn (*Janka*, 1865, in Herb. Kew.); Budapest (*Besser*, in Herb. Kew.); Buzd, Riomfalva, Kolos, Torda, and Boldan (*Heuffel*), in Transylvania (ex *Simonkai*, Fl. Transsilv. 1886, p. 300); banks of the R. Tisza, in the county of Csongrad (*A. F. Lang*, 1827, in Herb. Kew.), and higher up the river at Sz. Marton, in the county of Kumania-Szolnok (*Baumgarten*, Enum. stirp. Transsilv. iii. [1816]); R. Tisza (herb. *Ball* and herb. *Besser*); county of Neves (*Sadler*), and county of Zemplin (ex *Nees*, Gen. Sp. Aster. p. 162). Roumania: in woods at Saveni, and elsewhere in Moldavia on the banks of the Pruth (*Guébhard*, Enum. plant. Moldav. MSS., in bibl. A. De Candolle, cum pl. exs. 1842–48 collectis). Russia: governments of Podolia, Ekaterinoslav, Tambov, and Crimea; and, in Asiatic Russia, at Borotala (*Regel*, 1878, in Herb. Kew.), and across the desert of Soungaria, in the prov. of Semirietshensk, to the R. Kurtschum south of the Bolshoï Altaï range, in the prov. of Semipalatinsk, which is the eastern limit of the plant (partly ex *Ledebour*, Fl. Rossica).

This *var.* δ has often been confused with *var.* θ, both by collectors and in herbaria, and specimens wrongly named. It has been a matter of difficulty among the herbarium specimens available to apportion correctly the plants to their respective varieties. It is doubtful whether var. *insculptus* extends further north than the central governments of Russia, and still more doubtful whether var. *dracunculoides* extends so far west as Hungary; so that records of the more extended range of either of them are not to be trusted as accurate without a careful examination of the specimens them-

selves. The present *var.* δ may at once be distinguished from var. *dracunculoides* by the more numerous ligules (9–12), and the much narrower scarious margins of the inner (upper) scales of the anthodium, which in the latter form are broadly membranous, and of which even the outer scales have a distinct membranous margin. The distribution of var. *insculptus* given by De Candolle (Prodr. v. p. 255) should, for the most part, be credited to var. *dracunculoides*. The present description has been drawn up from a series of typical Hungarian specimens in Herb. Kew. The locality given by Linnæus, "in Hungaria interamni," refers to this form of the species.

Syn. *Aster canescens* Simk., *A. canus* Baumg., *A. dracunculoides* Bess., *A. exaltatus* Barth, *A. punctatus* W., Waldst. & Kit., *Crinita punctata* Mönch, *Galatea punctata* Cassini, *Galatella insculpta* Nees, *Linosyris punctata* Cand., *Galatella punctata* var. *grandiflora* Lallem., Ind. sem. hort. Petropolit. viii. n. 1238 (1841).

ε. *squamosus*.—Folia oblongo-linearia. Pedicelli polyphylli, apice confertim squamati. Anthodium basi conicum, haud rotundatum. Ligulæ circiter 10. Discus multiflorus.

Hab. On salt swamps in the delta of the Volga, near Astrakhan (*Eichwald*); E. Bokhara (*Regel*, 1883, It. Turkestan.—"Galatella punctata" in Herb. Kew.).

Syn. *A. acris* Bieb., *A. dracunculoides* Eichw.

ζ. *pauciradiatus*.—Folia inferiora oblonga trinervia, superiora oblongo-linearia trinervia nervis lateralibus incompletis (ut in *var.* β). Corymbus simplex vel ramosus. Calathia minuscula. Anthodium basi conicum, haud rotundatum. Ligulæ 5, vel pauciores.

Hab. Asiatic Russia. Along the R. Charysh, a tributary of the Ob, in the prov. of Tomsk (ex *Ledebour*); at 1860 metres near the village of Kypinka in the prov. of Semirietshensk (*Tetissow*, 1879, Pl. exs. Turkestan. in Herb. Kew.—labelled "Galatella punctata *var.* parviflora").

Syn. *G. punctata* var. *angustifolia* Ledeb. Fl. Rossica, ii. p. 478. A Central Asian form analogous to var. *angustifolius* of W. Europe, but more strict in habit, with smaller flower-heads and fewer ligules.

θ. *dracunculoides*.—Caulis strictus sulcatus dense foliatus, in corymbum brevem obconicum solutus. Folia lineari-oblonga ad apicem usque trinervia, mucrone calloso apiculata, a basi oblique patentia, breviora quam in *varr.* β, γ, δ; superiora subfalcata fere lævia, punctis glandulosis raris sæpe nullis (immersis) micantia. Corymbus compactus plusminus obconicus leviter convexus, ramis patulo-erectis, di- aut ramoso-polycephalis, apice simili brevique corymbulo terminatis, ramulis tenuibus. Pedicelli stricti tenues. Bracteæ 1–2, exiguæ subulatæ adpressæ, interdum nullæ. Calathia minora quam in *varr.* β, γ, δ. Periclinium fere oblongum. Anthodium pallidum nec coloratum, vel squamis internis apice purpurascentibus; squamæ 4-seriatæ, late membranaceo-marginatæ, carina virente percursæ, aliæ obsolete trinerviæ, externæ acutæ, internæ obtusæ. Ligulæ 5–6. Flores disci 4–7 (vel rarius 8–9). Semen fuscum.

Hab. Roumania and Russia. The extreme limits of its range are :—

N. Kazan (*Wirzen*, Dissertatio Academica in geographia plantarum per partem provinciæ Kasanensis, 1839 ; *Prof. Kittary* in Herb. Kew.).

S. Government of Elizabetpol, in the Asiatic province of Trans-Caucasia (ex *Ledebour*), and in the Karabagh District (*Szovits* in Herb. Kew.).

E. Barnaul, in the province of Tomsk, Siberia (Herb. Kew., ex herb. Delessert ; specimens dated 1780).

W. Tiiganesci, in Moldavia (*Guébhard*, Enum. plant. Moldav. MSS., in bibl. A. de Candolle, cum pl. exs. 1842–48 collectis).

Geogr. distrib. Roumania : Tiiganesci, in Moldavia, and Kara-Nasieb, near Baba-dagh, in the Dobrudscha (*Sintenis*, 1873, n. 424, in Herb. Kew.) ; also in Wallachia (*Friwaldzky*, ex Boiss., Fl. Orient. iii. p. 161). Russia : the governments of Kazan, Penza, Saratov, Orenburg, Podolia, Ekaterinoslav, Kherson, Bessarabia, Astrakhan, province of the Don Cossacks, the Crimea, Terek territory and Daghestan territory, in Cis-Caucasia (*Ledebour*) ; Kursk (in Herb. Kew., dated 1899) ; in Asiatic Russia, Trans-Caucasia (*Ledebour*) ; prov. of Tomsk ; along the River Tekes (*Przewalsky*, 1876, in Herb. Kew.) ; Mt. Alatau (ex *Ledebour*) ; Tian-Schan Mountains (*Ruprecht* in Sertum Tianschanicum, p. 51, 1869) ; all these three in the prov. of Semirietshensk ; Ili Valley, in the same province (*Semenov*, in Herb. Kew.) ; prov. of Semipalatinsk (*Bunge* ex *Lehmann*, Reliq. Bot. n. 611, in Herb. Kew.), also Aryschyr at 1650–1800 metres (*Regel*, 1879, It. Turkestan, in Herb. Kew.), and north of the desert of Soungaria (*Ledebour*) ; on the Hunger Steppe of the prov. of Akmolinsk (*Korshinsky* in Herb. Kew.), and along the banks of the R. Irtysch (*Karelin & Kiriloff*, 1840, in Herb. Kew.) ; and, lastly, in the prov. of Uralsk (*Ledebour*). It has also been reported from the Tekke-Turkomans District of the Trans-Caspian Province, at Askabad, on the confines of Persia (*Sintenis*, n. 1001, 1901, in Herb. Kew.). In Clarke's *Travels*, vol. i. p. 601 (1810), the following passage refers to this plant :—"Upon and near the banks of the Dnieper were the following plants . . . . *Aster punctatus*, dotted star-wort (see Wildenow)."

Syn. *Aster dracunculoides* Lamk., *A. lætus* Fisch., *A. linifolius* Güldenst., *A. punctatus* (punctalus) E. D. Clarke, *A. strictus* Wender., *Galatea pauciflora* Cassini, *Galatella desertorum* Karel. & Kiril., *G. dracunculoides* Nees, *G. pauciflora* Nees, *G. punctata* var. *dracunculoides* Lallem., *G. punctata* C. A. Mey., *Gelasia desertorum* Less., *G. pauciflora* Nees.

Lamarck's original brief description is :—"*Aster* foliis linearibus, integerrimis, margine scabris, trinerviis ; pedunculis foliosis, fastigiatis ; semi-flosculosis subquinis." It was described from specimens cultivated in the Royal Gardens at Versailles.

i. discoideus.—Folia lanceolato-linearia, apicem versus sensim acuminata, basi tantum leviter torta (sed haud omnia), tri- vel uninervia. Pedicelli subdiphylli vel interdum nudi, bracteis minusculis. Calathia discoidea, 10–30 florum (ligulis carentibus).

Geogr. range. Russia, from Podolia and the frontier of Galicia to Lake Baïkal and the confines of Mongolia.

f. *scabra.*— Caulis glabriusculus, superne corymboso-ramosus ibique cum foliis plusminus scaber. Folia inferiora 3-nervia, cetera 1-nervia.

Distrib. That of the type, in several of the southern governments and in the Caucasian provinces; at Krasnojarsk in prov. of Yeniseisk, and at Irkutzk in prov. of Irkutzkaya (*Regel & Herder* in Bull. Soc. Nat. Mosc. 1867, i. p. 16); in the prov. of Semirietshensk, at 2700 metres above the Kungei Valley, along the north bank of the lake of Issyk-kul (*Regel*, It. Turkestan., in Herb. Kew.); in the prov. of Semipalatinsk, between Lake Nor-Zaizan and the R. Kurtschum (*Schrenk*, 1866, in Herb. Kew.), *Karel. & Kiril.* in Bull. Soc. Nat. Mosc. 1841, p. 436); near Arkalyk, and Lake Nor-Zaizan (*Lehmann*, 1840, n. 613, in Herb. Kew.); the Hunger Steppe of the Kirghiz desert in prov. of Akmolinsk; in prov. of Uralsk, near Lake Inderia, and round the salt-marshes of Iletzk, extending southwards into the northern part of the Trans-Caspian province (*Karelin*, pl. exs. Turkomanicæ).

Syn. *A. acris* S. G. Gmelin, *A. bifidus* Nees, *Chrysocoma biflora* L., *C. dracunculoides* Lamk., *C. Tatarica* Less., *Crinitaria biflora* Cassini, *Galatella biflora* Nees, *Linosyris glabrata* Lindl., *L. punctata* Karel. & Kiril., *L. Tatarica* C. A. Mey., *L. Tatarica* var. *scabra* Karel. & Kiril. in Bull. Soc. Nat. Mosc. 182, p. 378.

f. *floribunda.*—Caulis fere a basi ramosus, ramis confertis. Folia glabriuscula, inferiora 3-nervia, superiora 1-nervia. Calathia paullo majora quam in forma typica.

Hab. Along the R. Ajagus, in prov. of Semirietshensk.

Syn. *Linosyris Tatarica* var. *floribunda* Karel. & Kiril. in Bull. Soc. Nat. Mosc. 1842, p. 378.

f. *macilenta.*—Caulis tenuis, parce ramosus, cum foliis angustioribus velutino-villosus.

Hab. Along the R. Lepsa, in the Seven Rivers district, between the Alatau Mountains and Lake Balkash, in prov. of Semirietshensk.

Syn. *Linosyris Tatarica* var. *macilenta* Karel. & Kiril. in Bull. Soc. Nat. Mosc. 1842, p. 378.

f. *Kewensis.*—Glabriuscula. Folia lanceolato-linearia, omnia distincte trinervia, sed punctis glandulosis paucis impressa. Corymbus plerumque 6 calathiorum. Folia inferiora 4½ ctim., media 3½ ctim., suprema 2½ ctim. Flosculi in quovis calathio circiter 20. Pappi pili in flosculo mediocri 76.

This is a plant growing in the Herbaceous Ground, Kew Gardens, labelled "Aster trinervis," in full flower in September, and in fruit in October. Among the forms with disk-flowers only, it seems to hold a position analogous to that of var. *affinis* in the forms with ligulate flowers, as the glandular dots on the leaves are few and scattered. Mr. Irvine, who is in charge of this section of the Gardens, tells me that it is of unknown origin, and has been there for several years. The plant was received from the Petersburg

Botanic Garden, and is probably of Siberian origin. The description was drawn up from the plant *in situ*.

ICONOGRAPHY.

Var. α. Jord. & Fourr. Ic. fl. Eur. ii. n. 450, t. 350 (Avr. 1903), *Galatella deflexa*.

Var. β, f. 1. Lobel, Pl. Stirp. Ic. 349, f. 2 (1581), *Aster minor Narbonensium;* Chabrey, Stirp. Ic. Sciagr. p. 325, f. 6 (1666), *Aster atticus Monspeliensis*—not cited by Linnæus or any other author, but the cut seems to me to represent this plant quite clearly; Barrelier, Pl. Gall. Hisp. Ital. Ic. 606 (1714), *Aster angustifolius;* Garidel, Hist. Pl. env. Aix, p. 47, t. 11 (1723), *Aster caule erecto umbellifero;* Reichb. Ic. fl. Germ. Helv. xvi. p. 7, t. 908, f. 4 (1853), *Galatella punctata;* Jord. & Fourr. Ic. fl. Eur. ii. nn. 445–449, 451–454, tt. 345–349, 351–354; All. Ic. Taurin. xix. 44*; Cavan. Ic. descr. Plant. Hisp. iii. p. 17, t. 232 (1795), *Aster hyssopifolius*.

Var. β, f. 2. Cavan. Ic. descr. Plant. Hisp. iii. p. 17, t. 233 (1795), *Aster acris*.

Var. β, f. 3. Barrelier, Pl. Gall. Hisp. Ital. Ic. 605.

Var. δ. Waldst. & Kit. Pl. rar. Hung. ii. t. 109 (1805), *Aster punctatus:* Bot. Reg. xxi. t. 1818 (Dec. 1835), *Galatella punctata*.

Var. θ. Plukenet, Alm. Bot. p. 56, t. 271, f. 3 (1696). The figure would seem to do either for this variety or the preceding; which of them it may represent is doubtful, but I have cited it for the var. θ, as Lamarck, in his original description of *Aster dracunculoides*, singles it out as representing the plant cultivated at Versailles.

The only gall recorded as infesting the species is that of *Xylostophora gypsella* Const. (Sorhagen in *Illustr. Zeitschr. f. Entomol.* iii. 1898, p. 114).

NOTES ON MR. DUNN'S 'ALIEN FLORA,'

WITH PARTICULAR REFERENCE TO GLAMORGANSHIRE PLANTS.

By H. J. Riddelsdell, M.A.

The first cursory glance at Mr. Dunn's *Preliminary List of the Alien Flora of Britain* raises the question, What is the meaning of "indigenous" and "non-indigenous"? Plants like *Ranunculus repens*, *Sisymbrium Alliaria*, *Arenaria serpyllifolia*, several of the Geraniums, and others, are placed in italics in the list, on the ground that, "though probably natives," they "have so far been

* For the recent and only account of this interesting collection of engraved figures of Italian plants, reference may be made to a work issued under the auspices of the Botanical Institute of Turin by Prof. O. Mattirolo, in November, 1904—"*Scritti Botanici pubblicati nella ricorrenza centenaria della morte di Carlo Allioni*," p. 95, etc. This particular plate in the 19th fasciculus is by F. Peyroleri, of uncertain date, but somewhere between 1766 and 1784. Some of the plates were also utilized in Allioni's *Fl. Pedemontana*, but not this one.

exclusively or chiefly recorded in floras in their non-indigenous localities." Many of such plants are recorded in most floras in a perfectly general way, assigned to no detailed localities, just because they occur too frequently to make detail tolerable. It is fair then to suppose that Mr. Dunn regards the *general* character of the habitats in which many species are usually found as making a case against indigeneity. And it is to this point that a few lines may perhaps fitly be addressed.

In Lord de Tabley's *Flora of Cheshire*, *Ranunculus repens* (to take an example) is said to grow on "Roadsides, pastures, ditches, and in arable land. . . . Native. Generally distributed." Its occurrence in Kent (after Hanbury and Marshall), "Native. Cultivated land, waste places, hedge-banks, marshes, pastures, and open places in woods, particularly on heavy soil; most abundant." The *Flora of Berks* (G. C. Druce) notes *exceptions*, "Native . . . common and generally distributed, except on the grassy chalk downs and in the heathy districts of the Bagshot sands." Here we have three good Floras treating *R. repens* as native in its usual habitats. No doubt Mr. Dunn would agree to this estimate—"native," in the sense, I suppose, of indigenous and aboriginal—for all localities undisturbed by man. No one can have seen the plant growing luxuriantly in marshy meadows, and similar very wet spots, and retained any doubt of its status. The point, I imagine, at which many will part company with Mr. Dunn, is reached with the records from any prepared ground, or ground disturbed by the occupancy of man. Under this head come the roadsides, waste places, hedge-banks, ditches, cultivated (arable) land, cited above. The species is frequent in such localities; gardens, railway and other ballast, and many other varieties of ground produce it in quantity, and in some variety of form. I may misunderstand Mr. Dunn's point; but it is only here that I can see any opening for doubt of the indigeneity of *R. repens*. There is nothing in its European distribution to cause doubt.

But surely the matter only needs expanded statement to show that Mr. Dunn's interpretation of our records cannot stand. His position, I conceive, is this. *R. repens* grows freely along roadsides and in other ground made or disturbed by human agency. Therefore human agency is the means of its introduction into such localities. But surely it cannot be doubted that it grows widely enough in native localities to account for its spread to made ground; and it must happen very often that the made ground occupies an area where *R. repens* grew before disturbance. Any deliberate introduction by man to the localities in question is of course impossible; and in most cases—*e. g.* in ground merely disturbed, and not made, such as ploughed land, ditches, waste places, and so on—any accidental introduction is highly improbable. But with such common plants, native in so many places, it seems misleading to regard their spread to altered ground as constituting "introduction." Many occurrences in altered ground are cases of persistence rather than introduction; many others, probably most others, are merely the matter-of-course spread of a common and flourishing species.

I would suggest that the idea of "introduction" or "non-indigeneity" should be reserved for the occurrence of plants which are either not native in the country, or not native in the immediate vicinity, or which have been carried by human agency. This would cover the recent spread of species like *Linaria viscida* and *Crepis taraxacifolia;* it would not cover, and I think should not cover, distribution of plants by bird agency and the like. Much of all this may be applied, *mutatis mutandis*, to other species italicized by Mr. Dunn.

This attempt at limiting the idea of the "non-indigenous" probably needs further working out,—if the subject is worth further consideration, of which I have some doubt. It is intended to serve as an introduction to a few notes, relating chiefly to Glamorganshire plants. They follow the order of the *Alien Flora*.

Aconitum Napellus L. Aboriginal, I believe, over a large area in the Ely Valley, between Llantrissant and Cardiff, Glamorgan. But I suppose correctly represented in the List.

Clematis Vitalba L. Should not this be omitted from the List? Surely it is native in the localities on the chalk and various limestone formations of the Midlands, Glamorgan, and other counties mentioned in Top. Bot. ed. 2—*i. e.* in the south half of England. In Glamorgan it is much more than "probably native"; in the great majority of its localities it is undoubtedly native. This falls in with H. C. Watson's view (see Cyb. Brit. i. 70, and Top. Bot. ed. 2).

Ranunculus repens L. Native and luxuriant in damp meadows, marshes, &c., of Glamorgan; no less native, though less luxuriant in many drier spots, on disturbed or undisturbed ground. One of the earliest plants to spread to newly disturbed ground, like ploughed land, roadsides, &c.; and one of the most successful in adapting itself to a large variety of circumstances. It holds the same claims to an indigenous status as e. g. *Poa annua* L., which is altogether omitted from Mr. Dunn's List.

Brassica nigra Koch. "Presumably non-indigenous," per List. Yet H. C. Watson (Top. Bot.), Druce (Fl. Berks and Oxon), Townsend (Fl. Hants), Murray (Fl. Somerset), Hanbury and Marshall (Fl. Kent), Lees (Fl. West Yorks), have no doubt of its being "native," *e. g.* on river-banks, sea cliffs, &c. It occurs in Glamorgan in some abundance on the top of the lias cliffs near Llantwit Major and on Nash Point, in situations and in associations which confirm the above opinions, formed as they are on a wide knowledge of field botany. Within my experience, it is particularly a plant of river-banks, and is, I believe, very plentiful in some parts by the Severn and its tributaries. I have no doubt it is truly native in Glamorgan.

Brassica oleracea L. This I cannot doubt is truly indigenous. It grows in great profusion for miles along the face of the lias cliffs on the Glamorgan coast, associated with *Limonium occidentale*, *Carduus eriophorus*, and the like.

Draba aizoides L. I long had doubts of this species; but oft-

repeated search along the Gower cliffs of mountain limestone has removed my hesitation. It occurs from Pwlldu Head to Worms Head with every sign of being aboriginal. The localities seem to be two—(1) Pwlldu Head to Pennard Castle; (2) and further west, about Mewslade Bay and Worms Head: in much greater profusion in the former locality. Its extremes of distribution are twelve miles apart. The continental distribution (Belgium, Germany, France, Spain) of course marks the Glamorgan localities as outliers. The first identification of the species on the ruins of Pennard Castle, which of all its Glamorgan habitats is most easily accessible, along with the fact that handbooks often simply mention the Castle, has probably helped to lead to the lowering of its status. Yet it is not on the Castle that it occurs in greatest quantity. I believe that Mr. Ley, Mr. Marshall and Dr. Shoolbred, in whose company I have gathered it, agree that it is indigenous.

Arenaria serpyllifolia L. is, like *Ranunculus repens*, one of a number of common plants found often on ground altered or prepared by man's agency. On dry sandy or rocky ground—e. g. *on many of the sandhills of our coast*—it cannot be regarded as other than indigenous. Its extension to wall-tops, field-borders, and the like is not in any true sense an introduction; the extension takes place through perfectly natural means. It hardly serves any useful purpose to give it, as the Alien List does, a status equal to that of e. g. *Diplotaxis tenuifolia* D.C.; and, moreover, to do so does not seem to agree with the facts.

Althæa officinalis L. The large majority of its occurrences (*i. e.* in the vicinity of marshy places near the sea) are to my mind native. It is undoubtedly so where I have seen it in Glamorgan, as at Oxwich, Llanmadoc, &c.

Lavatera arborea L. is treated by Mr. Dunn as "presumably non-indigenous." But it is aboriginal on the remotest and wildest parts of the cliffs of Gower; and it looks just the same about the Lizard.

Malva rotundifolia L. is native on many of the shingly and sandy fore-shores of Glamorgan, and of Devon and other counties. It is not even printed in italics in the Alien List.

Geranium columbinum L., *G. dissectum* L., *G. lucidum* L., *G. molle* L., along with *G. pusillum* Burm. f. (the last only is treated as "presumably non-indigenous," and printed in ordinary type) are all on much the same footing with many other plants of this List; they occur frequently on prepared, disturbed, or made ground, without thereby forfeiting their right to be regarded as native in the great majority of cases. *G. pusillum* is often enough a plant of the seashore sand to deserve some recognition as a native of Britain; it occurs on Sketty Burrows, &c., in Glamorgan.

Euonymus europæus L. is so often a plant of woods and copses, and of cliff faces, on calcareous soil (*e. g.* in Glamorgan), that even though it is sometimes planted, its claim to full indigeneity is very strong. It has, I take it, no more right to appear in the List than *Cratægus Oxyacantha.*

Vicia lutea L. is denied all claim to the indigenous status. But

surely it is truly native, *e. g.* at the Lizard. I have not seen it in Glamorgan save as a casual.

Trifolium maritimum L. keeps *V. lutea* company in the List. One would like to know why. It is as native as any other seaside plant in Glamorgan and Monmouth counties.

Saxifraga tridactylites L., again, occurs on walls, for it likes rocky ground without much competition, and is content with an open sky and little soil. But as it occurs in Glamorgan in large quantities at several distant spots, on rocks and sand near the sea, and on bare limestone elsewhere, in each case perfectly native; and as many writers of county and other Floras unhesitatingly regard it as indigenous in hundreds of localities, it seems out of place to say that it is so far "exclusively or chiefly recorded" from non-indigenous localities.

Epilobium angustifolium L. seems to be one of the plants which most deserves the italics of the List. It spreads over the waste ground of the colliery districts of Glamorgan in great quantities, just as it does over *e. g.* peat moors recently disturbed. Though I have seen it more than once in very remote spots in the Scotch Highlands at 2000 feet, quite native, and (very rarely) native in similar localities (high difficult mountain cliffs) in the county of Glamorgan, as well as in other places, yet the sum of my experience points to the majority of occurrences as introductions, and introductions not obviously or even probably from any indigenous plants near at hand. It is quite a different case, as one would expect from the nature of its seeds, from *Ranunculus repens*, *Saxifraga tridactylites*, &c.

Cotyledon Umbilicus L. and *Ceterach officinarum* Willd. stand, in Glamorgan, on precisely the same level (though the latter does not appear in the List). Both occur in aboriginal situations on coast cliffs and other rocky ground, and spread of their own accord from these spots to habitats altered by human agency.

Carum segetum Benth. & Hook. f. is certainly native in some localities in Glamorgan, as at Barry on the lias. This is a new county record for v.-c. 41.

Carduus acanthoides L. has, so far as its distribution in Glamorgan goes, as much claim to be considered indigenous as has *C. nutans*, with which it frequently occurs, on dry soil like lias, mountain limestone, &c.

C. pycnocephalus L. occurs in such large quantities on all kinds of soil and in all associations along our coast, that I have no hesitation in ranking it as a true native.

Anagallis arvensis L. (printed in italics in the List) and *Lycopsis arvensis* L. both hold a very strong claim to the status of natives. Both occur, the former in large quantities, on the sands of Oxwich Bay and other places on the coast, and do so with such regularity as to leave no doubt in my mind. The former occurs in a dwarf form, with flowers of normal size, and generally in dampish places among sandhills, where associated plants are *Epipactis palustris*, dwarfed *Samolus*, &c.

"*Galeopsis Ladanum* L." is also a native of our county, occurring

on the shingle of the foreshore near the Leys, at Pwlldu and other places.

Marrubium vulgare L. is native on the sands of Porthcawl, and many of the cliffs of Gower, in spots where no possibility of introduction exists, and *Nepeta Cataria* L. has very similar claims to be regarded as native, especially in Gower.

Asparagus officinalis L. is native on the cliffs of Oxwich Bay, and in several other Glamorganshire localities.

ADDITIONS TO THE WEST LANCASHIRE FLORA.

By J. A. Wheldon, F.L.S., and Albert Wilson, F.L.S.

Since the publication of our last notes (Journ. Bot. 1902, pp. 346–350, 412–416), a further examination of some previously little-worked portions of West Lancashire has resulted in the discovery of a number of interesting species not previously known to occur in the vice-county. These we now put on record, together with a few others which are noteworthy, either in confirmation of old records, or because their rarity renders the discovery of an additional station interesting. We also include several new records extracted from the recently published (1903) *Flora of Preston and Neighbourhood*, compiled by members of the Botanical Section of the Preston Scientific Society.

We have again to thank Mr. C. Bailey, F.L.S., Mr. H. Beesley, and the Rev. P. J. Hornby for information or specimens. We are greatly indebted to the Rev. W. M. Rogers for help in naming the brambles; and to Messrs. Ar. Bennett, W. R. Linton, James Groves, H. N. Dixon, and S. M. Macvicar, for much assistance in determining other critical species.

New county records are indicated by an asterisk. Plants mentioned in the *Flora of Preston and Neighbourhood* are distinguished by the initials *F. P. N.* Other contractions used are *Wh.* (Wheldon) and *Wi.* (Wilson). Where no authority follows a locality the record rests on the responsibility of the authors jointly.

**Ranunculus Flammula* L. var. *pseudo-reptans* (Syme). Dale Gill, Hindburn, and Tarnbrook Fell, Sept. 1902.

Trollius europæus L. Gorge of the Greeta near Wrayton, and bank of the Leighton Beck, *Wi.*

Actæa spicata L. A second locality for this very rare West Lancashire plant has been discovered in the neighbourhood of Leck, *Wi.*

**Lepidium ruderale* L. St. Annes, 1900, *C. Bailey.*

**Crambe maritimum* L. Lytham, *F. P. N.* Introduced?

**Raphanus maritimus* Sm. Lytham, *F. P. N.*

Rubus Lindebergii P. J. Muell. Wood near Hawes Water, Silverdale, Sept. 1904. "This, and the next, are both quite typical," W. M. R. — **R. Gelertii* Frider. var. *criniger* Linton. Claughton, near Garstang.—**R. radula* Weihe, var. *echinatoides* Rogers. Near

Cockerham, Aug. 1904, *Wi.* Mr. Rogers writes, "Off type for my var. *echinatoides* (in leaves especially), but cannot be kept from it."—**R. corylifolius* Sm. var. *cyclophyllus* Lindeb. Knott End, 1902, *Wh.* Canal-bank near Yealand.

**Rosa canina* L. var. *vinacea* Baker. Near Warton, Sept. 1903. Silverdale. — *Var. *dumetorum* Thuill. Barnacre, near Garstang, Sept. 1902.—Var. *arvatica* Baker. Highfield, near Carnforth, Sept. 1904.

**Ribes rubrum* L. var. *petræum* (Sm.). Wooded bank of the Lune below Kirkby Lonsdale Bridge, May, 1904.

**Crithmum maritimum* L. Sea-coast between Silverdale and Carnforth, Sept. 1904.

**Galium boreale* L. Bank of Lune near Halton, at only 50 ft. above sea-level, July, 1903, *Wi.* Occurs also plentifully on rocky islands at the Crook of Lune near Caton.

**Dipsacus sylvestris* Huds. Ashton, *F. P. N.*

Hieracium diaphanoides Lindeb. Between Halton Station and the Crook of Lune, July, 1904. — *H. gothicum* Backh. Limestone rocks about the pot-holes on Leck Fell, Aug. 1904, *Wi.*—**H. umbellatum* L. Near Docker, Sept. 1903. The type. The only previous records for *H. umbellatum* in West Lancashire—from sandhills near Lytham, and St. Annes—refer to the variety *coronopifolium* (Bernh.).

Blackstonia perfoliata Huds. Lytham, *F. P. N.*

Lathræa Squamaria L. Wooded gorge of the Hodder below Whitewell, in considerable quantity, March, 1903.

Orobanche minor Sm. Lytham, *F. P. N.*

**Galeopsis Ladanum* L. Lytham, *F. P. N.*

**Ballota nigra* L. Near Docks, Preston, *F. P. N.* Probably introduced.

**Beta maritima* L. Ribble banks, *F. P. N.*

**Euphorbia portlandica* L. St. Annes to Blackpool, *F. P. N.*

Orchis ustulata L. Near Over Kellet, June, 1903, *Wi.*

Polygonatum officinale All. Limestone crevices in Gatebarrow Wood, locally abundant, June, 1904, *Wi.*

Sagittaria sagittifolia L. Casual, Ashton, *F. P. N.*

Potamogeton pectinatus L. River Lune near Skerton, Lancaster, *Wi.*

Scirpus rufus Schrad. Salt-marsh below Heald Brow, Silverdale, *Wi.*

Carex digitata L. Gatebarrow Wood, near Silverdale, abundant, *Wi.*—**C. axillaris* Good. Canal near Brock. Discovered by Mr. Moss, and the locality communicated to us by the Rev. P. J. Hornby. —**C. stricta* (Good.). Ditch-side, Silverdale Moss, June, 1904, *Wi.*

Melica nutans L. Gatebarrow Wood, *Wi.*

Avena pratensis L. Gorge of the Greeta near Wrayton, July, 1904, *Wi.*

**Hordeum secalinum* Schrad. Lea, *F. P. N.* — *H. maritimum* Huds. This we recorded in error in this Journal, Feb. 1900, p. 47, "Near Lytham, 1883, *Wi.*" The plant referred to was probably *Festuca uniglumis* Soland.

**Elymus arenarius* L. Bank of the Wyre at St. Michaels, 1903, *Rev. P. J. Hornby.* St. Annes (planted?), *H. Beesley.*

**Nitella opaca* Agardh. The first vegetation to appear in a newly made pond near Garstang, July, 1903, *Wi.*

**Diphyscium foliosum* Mohr. Lower Easegill, near Leck, May, 1903, *Wi.*

Swartzia montana Lindeb. Gorge of the Greeta near Wrayton, and bank of the Lune near Halton.

Brachydus trichodes Fürnr. Parlick Pike, S.W. and S.E. gullies, *Wi.*

**Rhabdoweisia denticulata* B. & S. Grit rocks on N.W. side of Wardstone, Aug. 1904, *Wi.*

Blindia acuta B. & S. Lower Easegill, *Wi.*

**Fissidens crassipes* Wils. Rocks in bed of the Lune near Caton, July, 1904.

Grimmia Doniana Sm. Grit rocks on Wolf Fell, *Wi.*

**Phascum cuspidatum* Schreb. var. *Schreberianum* Brid. Broughton, near Preston, Oct. 1903, *H. Beesley.*

Barbula sinuosa Braithw. Near Over Kellet.

**Weisia tenuis* C. M. Shaded sandstone rocks, gorge of the Greeta near Wrayton, July, 1904, *Wi.*

**Zygodon Stirtoni* Schimp. Near Whitewell, March, 1903. — *Z. conoideus* Hook. & Tayl. Gorge of the Hodder near Whitewell, on elders, fruiting freely.

Ulota crispa* Brid. Cringlebarrow, June, 1903, *Wi.* Dalton Crag, *Wi.*—*Var. *intermedia* Braithw. Dalton Crag, Feb. 1904, *Wi.* —U. phyllantha* Brid. Between Carnforth and Nether Kellet, Sept. 1904.

**Orthotrichum pulchellum* Sm. Lower Easegill, near Leck, May, 1904.

Discelium nudum Brid. Parlick Pike, at 1050 ft., *Wi.*

Aulacomnium androgynum Schwaegr. On elders in the gorge of the Hodder near Whitewell, along with *Zygodon conoideus* Hook. & Tayl.

**Neckera pumila* Hedw. var. *Philippeana* Milde. On tree near Silverdale, June, 1904, *H. Beesley.*

**Thuidium delicatulum* Mitt. Lower Easegill, July, 1903, *Wi.*

Hypnum elodes Spr. In a damp hollow on the limestone pavement where water had stood, Gatebarrow. — *H. sarmentosum* Wahl. Moorland E. of High Park, Lower Easegill, *Wi.*

Hylocomium brevirostre B. & S. Gorge of the Greeta, fruiting.

Andreæa crassinervia Bruch. Rocks by the Roeburn, *Wi.*

**Lejeunea ulicina* Tayl. Gorge of the Hodder near Whitewell, March, 1903.

**Blepharostoma trichophyllum* (Dill.). Clougha, June, 1902, *Wh.* Gorge of the Greeta.

Kantia submersa Arnell. Heysham Moss.

**Jungermannia turbinata* Raddi. Gorge of the Greeta, May, 1904. —*J. minuta* Crantz. Thrushgill Fell, *Wi.*

**Riccia Lescuriana* Aust. Gatebarrow, near Silverdale, Sept. 1904.

NOTE ON NOMENCLATURE.

[The following communication, published in the *Bullettino della Società Botanica Italiana* for 1904, pp. 328–330, has reference to the memorandum published in this Journal for the same year, pp. 233–236, and it seems desirable to reprint it here. M. Levier rightly points out that the principle advocated by Mr. Williams in his foot-note regarding *Hookera* is entirely opposed to that recognized by the English botanists whose memorandum appears in the same number of the Journal, with which M. Levier and most botanists are in accord.

With regard to Smith's substitution of *Brodiæa* for *Hookera*, reference may be made to this Journal for 1886, pp. 49–52, where Salisbury's protest against Smith's arbitrary and unjustifiable action is reprinted. Mr. Williams is in error in supposing that "only a single species of *Hookera* has been described"; Salisbury himself, when establishing the genus (*Paradisus*, t. 117), describes two (*H. coronaria* and *H. pulchella*); a third (*H. multiflora*) is named in this Journal (*l. c.* 51); and four others, described by Prof. E. L. Greene, are enumerated in the second Supplement to the *Index Kewensis*.—Ed. Journ. Bot.]

Le *Journal of Botany* a publié dans sa livraison d'août (1904) la traduction en anglais des "Adjonctions au Code de Paris, proposées par quelques botanistes italiens," traduction dont M. le docteur F. N. Williams voulut bien se charger sur la prière de l'un des signataires des deux motions. Le traducteur, qui est d'accord avec nous quant aux principes, paraît trouver que les exemples cités pour justifier notre seconde motion ne sont pas bien choisis et ajoute en note quelques remarques critiques auxquelles nous croyons devoir répondre enfin d'éviter tout malentendu.

I. *Radulum* Fries, 1825, ne force pas, selon notre proposition II, d'annuler *Radula* Nees 1833 (ex Du Mort., 1831), le premier de ces genres appartenant aux Champignons, le second aux Hépatiques, ce qui exclut tout danger de confusion. L'annotation de M. Williams rappelle au lecteur que "Engler et Prantl ont substitué *Stephanina* à *Radula*." Cela n'est pas tout à fait exact. L'auteur de cette substitution (inutile à notre sens) est Otto Kuntze (Rev. g. pl. I, p. 839; 1891), et ce n'est que deux ans plus tard (1893) que V. Schiffner adopta *Stephanina* dans l'ouvrage d'Engler et Prantl (Vol. I, part. 3, pag. 113). Le nom de *Stephanina* n'a pas été accepté par les autres hépaticologues, et le professeur Schiffner lui-même l'a désavoué dans tous ses ouvrages subséquents pour revenir à *Radula*. Le collaborateur des "Natürl. Pflanzenfamilien" s'est donc rallié à l'opinion générale que *Radula* peut être maintenu sans inconvénient à côté de *Radulum*.

II. M. le docteur Williams corrige dans le texte de notre seconde motion *Pigafettaea* Mart., 1837, en y substituant *Pigafettia* Becc., 1877, et fait observer en note que *Pigafettaea* Mart. ne constituait qu'une section du genre *Metroxylon*, nom de section qu'il suppose aboli par *Pigafettia* Becc. Or, c'est à dessein que nous

n'avons pas tenu compte du nouveau para-homonyme *Pigafettia*, simple lapsus calami du docteur O. Beccari qui, en élevant le sous-genre de Martius au rang de genre (Malesia, vol. i, pag. 89), a écrit en tête de l'article et, plus bas, ligne 11 du texte: *Pigafettia* Mart. au lieu de *Pigafettaea* Mart. sans y ajouter son nom. Une citation incorrecte, provenant d'une erreur de copie, peut et doit être corrigée sans autre dans les noms botaniques et n'est évidemment point consacrée par le seul fait que la faute d'orthographe figure dans un ou plusieurs binomes nouveaux, quelque correcte d'ailleurs que soit la détermination du genre.

III. A propos de notre exemple *Hookera* Salisb., Mars 1808 (Liliacées) et *Hookeria* Smith, Avril 1808 (Mousses), M. Williams fait remarquer en note "qu'une seule espèce de *Hookera* a été décrite et que la généralité des botanistes a préféré adopter le nom plus récent de *Brodiaea* Smith 1811, sous lequel beaucoup d'espèces ont été décrites." Le fait qu'il existe un seul binome commençant par *Hookera* et beaucoup de binomes commençant par *Brodiaea* ne nous semble pas une raison suffisante pour déroger à la loi de priorité, puisque *Hookera* a été intelligiblement caractérisé. Nous ne saisissons pas le motif "important" qui a induit Smith à changer le nom de Salisbury en 1811; s'il l'a changé à cause de la fâcheuse ressemblance entre *Hookera* et *Hookeria* Smith pouvait se dispenser, dès 1808, de créer un *Hookeria* peu de semaines après que *Hookera* avait été publié par Salisbury. Or, dans le même numéro du *Journal of Botany* (p. 233), dix des collègues les plus autorisés de M. le docteur Williams ont publiquement adhéré à l'article 59 du Code de Paris, ainsi formulé: "No one is authorized to change a name on the pretext that . . . . another is . . . *better known* . . . . or for any other motive contestable or of little value."—A strictement parler d'ailleurs, les deux noms *Hookera* Salisb. et *Hookeria* Smith n'ont pas la même étymologie, le premier étant dédié au peintre de fleurs William Hooker, le second à Sir William Jackson Hooker.

IV. La quatrième note de M. le docteur Williams invalide notre exemple *Anisomeria* Don, 1832 (Phytolaccacées), et *Anisomeris* Presl, 1833 (Rubiacées), attendu que *Anisomeria* serait primé par *Pircunia* Bert., 1829, et *Anisomeris* par *Chomelia* Jacq., 1760. Mais l'année 1829, pour *Pircunia* Bertero, est contestée par Otto Kuntze qui indique comme vraie date de publication 1833. Engler et Prantl, dont l'autorité est invoquée par M. Williams, à propos de *Stephanina*, admettent *Anisomeria* à côté de *Anisomeris*, et K. Schumann (vol. iv, 4, pag. 98; Rubiacées) explique entre parenthèses qu'il adopte le nom de Presl *Anisomeris*, parce que *Chomelia* Jacq., 1760, est lui-même primé par *Chomelia* L., 1737. Cet argument conserve toute sa valeur aussi longtemps que les botanistes ne se seront pas vocablement et unanimement fixés sur le point de départ de la nomenclature.

E. Levier.

SHORT NOTES.

Linaria Cymbalaria in Portugal. — I gathered this at Cintra in April last; it is not given for Portugal in Nyman's *Conspectus*. I also gathered near Lisbon a *Fumaria* which Mr. Pugsley thinks is *F. Gussonii* Boiss.—also unrecorded for Portugal in the *Conspectus*. *Iris bicolor* grew on some hills behind Lisbon; and I saw *Fritillaria lusitanica*, *Davallia canariensis*, *Woodwardia radicans*, *Asplenium acutum*, *Simethis bicolor*, *Narcissus obesus*, *Cephalanthera ensifolia*, *Arbutus Unedo*, *Viburnum Tinus*, *Asterolinum stellatum* (mimicking starved *Euphorbia exigua*), *Scilla monophyllos*, *S. campanulata*, *Geum silvaticum*, *Cistus hirsutus*, *C. salvifolius*, *Helianthemum guttatum*, *H. Tuberaria*, *Cytinus Hypocistus*, *Pedicularis lusitanica*, and many other interesting species. It would be very difficult to excel the beauty of the surroundings.—G. Claridge Druce.

Galium sylvestre in Worcestershire (Journ. Bot. 1904, p. 240). —This plant is already recorded in Journ. Bot. 1895, p. 217, by Mr. R. F. Towndrow, from "a pasture at Malvern Wells." In addition to the records mentioned by Mr. F. Townsend may be added Gloucestershire East, where I gathered it near Sevenhampton Common in 1900; here it grew in soil, once turf, but converted into arable, and now reverting to its original condition. — G. Claridge Druce.

Supposed Species of Ovularia (p. 41).—Another lately-published species of *Ovularia*, *O. Ranunculi* Oud. (in *Hedwigia*, xxxvii. 182 (1898)), collected on the leaves of *Ranunculus acris* in Holland, is to be referred to the conidial stage of *Erysiphe Polygoni* DC. Prof. C. A. J. A. Oudemans informs me that no example of the plant has been preserved. The main diagnostic characters mentioned by the author are: a superficial mycelium (on the upper surface of the leaf), consisting of delicate creeping hyphæ, which produce short, upright, 4-celled conidiophores; the latter bear at their apex a single, continuous, hyaline, broadly-elliptic conidium, measuring 30 × 20μ. In examples of the conidial stage of *E. Polygoni* which I collected on the leaves of a species of *Ranunculus* at Cambridge, in September, 1904, the characters shown agree with those described above. The conidia, which often occurred singly (see p. 42), were somewhat variable in shape and size; the greater number were elliptic or broadly elliptic, and measured 30–38 × 20–22 μ; sometimes the conidia were subcylindric and rounded at both ends, and measured 40 × 19 μ; or they were comparatively short and broadly elliptic, measuring 30–34 × 20–23 μ. It is clear, therefore, that *Ovularia Ranunculi* Oud. must be sunk as a synonym of *E. Polgoni* DC. In the account given of "*Ovularia fallax*" I omitted to notice that Prof. P. Magnus had already (in Abhandl. Naturh. Ges. Nürnberg, xiii. 36 (1900) pointed out that Bonorden's plant was "the *Oidium* of an *Erysiphe*, probably *E. Martii* Lév.," and that this author had renamed the two true species of *Ovularia* as *O. Schwarziana* (Syd. Myc. March. nr. 3080) and *O. Villiana* (Syd. Myc. March. nr. 3393). I am indebted to Prof.

G. Lindau for drawing my attention to these points. — Ernest S. Salmon.

"Index Kewensis Supplementum II."—A Kew correspondent—not one of the "viri versatores" whom we, with inexcusable carelessness, dubbed "vires"—points out that four of the names which we stated in our review (pp. 63–65) were omitted from that work are really included in it, as well as nearly a third of the sixty-four transferred species of *Asclepias*, which had been published by Mr. Schlechter earlier than his list in this Journal. This is true, and we regret our error. Certain other explanations, such as the occurrence of names "in the middle of a paragraph," seem to us less tenable; for it is surely the function of the *Index* to take up names which are likely to be overlooked. On the other hand, further use of the *Supplementum II* has confirmed our impression as to its insufficiency; for example, the reduction (Bull. Herb. Boiss. vi. 562) of several of the species published by Klatt in an earlier volume has been overlooked, and Klatt's names (save in one instance) appear unreduced. *Hermstædtia Welwitschii* Baker in Kew Bull. 1897, 278, is retained (with the spelling of the generic name uncorrected), although, as was pointed out in this Journal for 1897, p. 452, *H. argenteiformis* Schinz, based on the same Welwitsch number, was published seven years earlier; moreover the plant is now generally accepted as a *Celosia*, where it was placed by Schinz in 1893. *Arnica columbiana* Greene (Pittonia, iv. 159) is omitted, perhaps because considered identical with *A. columbiana* of Aven Nelson, published a little earlier, though a glance at the text shows that the two are based on independent material. We also notice numerous misprints, some of which—such as "Helichrysum poycladum," and the universal use of a capital for a small s in "'s Lands Plantentuin"—should hardly have escaped the editor's eye; others are *Aster armeriifolius* (for *armeriæfolius*), *Antennaria nardinæ* (for *nardina*), *Arabis graciliceps* (for *gracilipes*), and the like. But we have no intention of disparaging a work which, as we said, is indispensable. We think, however, there was room for further care, and we hope that the reference given above will at least prevent similar omissions in the portion yet to appear. Ed. Journ. Bot.

NOTICES OF BOOKS.

Monographie du Genre Onothera. Par Monseigneur H. Léveillé, avec la collaboration de M. Ch. Guffroy. Fascicule I., 1902, 42 planches, pp. 138. Fascicule II., 1905, pp. 119. 8vo, Le Mans: Maison Monnoyer.

Two parts of this somewhat eccentric monograph have lately reached us; the third part, which we are told will be equal in size to the first two parts combined, although promised for February, 1904, has not, at the time of writing, come to hand. The author has also published in the *Bulletin de Géographie Botanique*, vol. viii.

(1898-9), unfortunately without any text, five heliogravures of certain species of *Œnothera* (or *Onothera*, as he prefers to write it), including supposed novelties—we doubt if the names of these can be considered as duly published—and in subsequent volumes some further plates. To illustrate Mgr. Léveillé's method of nomenclature we may instance his treatment of a plant he calls *O. Mandoni*, which he names, in 1898 for the first time, on one of these figures (which are not numbered). In his monograph he states it is the same as *O. Pana* O. Kuntze, which was also published in 1898. He therefore relinquishes both names and rechristens the plant *O. Kuntzeana*! This practice of giving names to plants already possessing one or more which are perfectly satisfactory can only tend to a useless and entirely unnecessary increase of synonymy, and is fortunately not likely to be widely adopted. But this is not the only departure from recognized custom: under *O. torulosa* Lév. are placed a large number of synonyms; it seems difficult to understand why all of these are rejected in favour of a new name, and the author gives no explanation.

Mgr. Léveillé's main divisions of the genus depend, for the most part, on characters drawn from the fruit, and are—i. Scutiformes; ii. Nuciformes; iii. Laterniformes; iv. Siliquiformes; v. Prismatiformes. He thus departs from the classification adopted by Dr. Sereno Watson in his paper on the Extra-tropical North American species, where the principal divisions depend largely on the character of the stigma. His collaborator, M. Ch. Guffroy, is responsible for the anatomical portions of the work, which generally consist of a description of a transverse section of the leaf, measurements of the bundles, and an elaborate account of the different character of the hairs, with numerous illustrations.

In publishing his novelties Mgr. Léveillé hardly seems to have given the matter the necessary consideration. For instance, *O. Autrani* and *O. Jonesii*, named for the first time on the plates in Bull. Géogr. Bot. viii., are reduced in his subsequent monograph to synonyms of *O. hirta* Link. The monograph is copiously illustrated; the heliogravure plates (from herbarium specimens), which are by no means satisfactory, and are not numbered, are by M. Bellotti; the drawings of herbarium specimens by M. Gonzalve de Cordouë; and the drawings of fruits by M. Acloque. The subscription price for the whole work is 50 francs, to non-subscribers 100 francs.

E. G. B.

English Estate Forestry. By A. C. Forbes, F.H.A.S., Lecturer on Forestry, Durham College of Science; late Forester on the Marquis of Bath's Longleat Estate. Edward Arnold. Price 12s. 6d. net.

"It is an ill wind that blows nobody any luck," and accordingly the day of agricultural depression has forced the English landowner to consider whether he cannot secure some profit by a more scientific system of forestry. The landowner is not, however, it would appear, so hard hit that he can be asked to sacrifice his rabbits for the sake

of his young trees; and, accordingly, the English forester feels bound to contrive a *modus vivendi* for rabbits and trees. Mr. Simpson, in *The New Forestry*, it is true, demanded the extermination of the ground game, save in special warrens; but Mr. Forbes is sanguine enough to believe in the efficacy of wire-netting and painting the stems. The present volume makes no pretence to be a manual of forestry: it is merely a collection of essays based on long practical experience of English estate forestry. The writer gives an interesting historical account of our forests, and discusses the possibility of their profitable extension, following Dr. Schlich in urging State aid for the woodland proprietor. He has also some weighty words on the harmful action of our "death-duties" upon forest management. The difference between the conditions here and those in Germany, or even in Scotland, is rightly insisted upon; and some most practical chapters deal with methods of sale, the nursery, landscape forestry, and park timber. Such a work naturally contains nothing of a purely botanical character: nor is there much in the chapters dealing with the sylvicultural treatment of the chief species, regeneration, and pruning, that has not already been summarily stated in such works as Dr. Nisbet's *British Forest Trees* and *Studies in Forestry*. When, in his chapter dealing briefly with fungoid, insect, and other enemies of our woodlands—a chapter disfigured by several misprints, such as "Marshall Wood" and "Dr. Massie"—the author deals with the larch *Peziza*, he evidently expects opposition. "Is it," he says, "a cause of bad health, or the effect of it? Nine out of every ten foresters, and ten out of every ten scientists would probably say the former. Yet we do not hesitate to question the accuracy of this opinion." This is, at least, courageous, and Mr. Forbes's practical experience commands a respectful hearing. The book is illustrated with more than twenty photographic plates, most of which are valuable as really illustrating the text, whilst printing and binding leave nothing to be desired.

G. S. B.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on the 2nd of February, a paper by Mr. W. J. Tutcher was read upon some plants (including new species) found on the island of Hongkong, with one from Kowloon and one from Wei-hai-wei. He pointed out that the island lies just within the tropics, about 22° N. and 114° E. from Greenwich; it consists of irregular granite mountain-ridges, the highest peak being Mt. Victoria, 1800 ft. The average rainfall is 85 in., most of which falls during the S.W. monsoon. The hills are broken up by ravines in which the vegetation is richest, but most of the vegetation which strikes the eye is due to the Afforestation Department, which has planted *Pinus Massoniana* in large numbers. Bentham's *Flora Hongkongensis* in 1861 enumerated 1053 species from the island, 159 of which had not at that time been found

elsewhere, but at the present time only about 50 of these remain peculiar to the island. The flora as now known amounts to about 1400 species, of which 100 are regarded as endemic, though probably many will be found natives of the mainland. Botanizing is difficult, as the collector has to hack his way through bamboo and shrubs amongst the boulders, some of which are large enough to block the passage. Ferns amount to 100; Grasses about as many; Leguminosæ nearly as many; between 70 and 80 Cyperaceæ; Compositæ over 60; and Orchids 60. *Quercus Eyrei*, first found by Capt. Champion, was not collected by any recent collector till the author refound it in quantity; even Hance had declared that Champion must have been mistaken in his locality. The luxuriance usually associated with tropical vegetation is here wanting, due to the poverty of the soil, which is almost exclusively disintegrated granite. The new territory leased to Great Britain in 1898 has an area of about 300 square miles—that is, ten times the area of Hongkong. Lantao is an island resembling Hongkong, but its highest peak is 3050 ft., with many well-wooded ravines, and when explored will doubtless prove rich in plants. In conclusion, some lantern-slides were shown, which displayed the character of the vegetation and scenery of the colony.

A FEW copies of the Second Supplement to the *Biographical Index of British and Irish Botanists* have been reprinted from this Journal, and may be had of the publishers. A few additions and corrections have been made, and one remains to be made—Mr. Charles Lawson had no claim to the prefix of "Sir," with which he has been endowed by the compilers.

A NEW genus and species of green algæ, a minute pelagic organism called *Clementsia Markhamiana*, is described by Mr. G. Murray in the *Geographical Journal*, xxv. 1905, pp. 121–123. It was obtained by tow-netting in the Atlantic, a few degrees south of the equator, during the outward voyage of the British Antarctic Expedition. Four stages of its life-history are figured on a coloured plate. It consists of colonies of minute green spheres enclosed within a common stout mucilaginous membrane, which becomes stratified as the units repeatedly divide. The author speaks of "allied forms, both Glœocapsoid and Chlorococcoid," and states that its nearest allies are from fresh water; the chlorophyll-green colour, the oil-drops, and the lamellated integument are suggestive of *Palmellaceæ*, and in particular of *Glœocystis*, of which two marine species are known, The name *Clementsia* has been adopted by Mr. J. N. Rose (in Bull. New York Bot. Garden, iii, 3 (1903)) for a genus of *Crassulaceæ* based upon *Sedum rhodanthum* A. Gray.

THE recent (January) part of *Hooker's Icones Plantarum* contains, as usual, much matter of interest. Dr. Stapf has elaborated eleven African Utricularias; his descriptions are accompanied by excellent figures. A new genus of *Helichryseæ—Thiseltonia*—commemorates "Mr. G. H. Thiselton-Dyer, son of the Director of Kew. Mr. Thiselton-Dyer, who is a mechanical engineer, and was engaged on the official tests of the pumping machinery for the Coolgardie Water Supply, makes no pretension to botanical knowledge, but in

the very little leisure he had, he succeeded in drying a collection of about two hundred species of plants. Having no means of transporting large parcels, and acting on advice, he confined himself almost entirely to small and chiefly inconspicuous plants, which constitute a most interesting element in the flora of West Australia. This miniature collection contains a number of curious plants, including two new genera and a considerable number of new and very rare species." Mr. Hemsley, who names the genus, calls the only species *T. Dyeri*. *Erichsenia*—named after Mr. F. O. Erichsen, with whom Mr. Thiselton-Dyer was associated as assistant—is a new genus of *Podalyrieæ* between *Viminaria* and *Daviesia*. We presume that the editor had some good reason for abandoning the lettering of the plates, which existed up to 2550; only this could compensate for the resulting inconvenience.

There is an interesting account of the life-history of *Glœocapsa crepidinum* by Mr. G. T. West in Trans. Edinb. Field Nat. and Micr. Soc. v. (1904), pp. 130–133. The plant occurs on mud, &c., in salt or brackish water. Seven stages of its life-history are figured in colours. Colonies of two or four cells are formed by simple cell-division, and are enclosed in a thick lamellated integument, since each daughter-cell secretes its own integument while still enclosed within the stretched integument of the parent-cell. When at last the outer integument ruptures, the units are set free, and divide and form new colonies. At intervals a resting-cyst with a spiny cellulose outer coat is formed, and when this germinates it forms a colony by simple cell-division. A colony of two measures about $55 \times 45\ \mu$. To clean the preparation it is placed in water at one end of a dish, which is covered over except at the opposite end; the organisms then leave the mud and travel towards the brightly illuminated end, and can be removed with a pipette and mounted or preserved in the following solution:—Copper acetate 0·5 gram, dissolved in distilled water 100 cc.; to this is added, at ordinary temperature, gum acacia 65 grams, and when it is dissolved, pure glycerine 55 cc. and mercuric chloride 2 grams are added; it should be filtered before use.

The same part of the *Transactions* contains a "List of 'Introduced' or 'Alien' Plants gathered by Members of the Society in the neighbourhood of Edinburgh during 1903 and 1904," by Messrs. James Fraser and James McAndrew. The list, which includes plants from seventeen localities, is a long one, but we do not understand, and the compilers do not explain, the principles on which it is constructed. A large number of the species mentioned are generally accepted as natives—such as *Lepidium campestre*, *L. Smithii*, *Nasturtium palustre*, *N. sylvestre*—and appear in *Topographical Botany* and in Sonntag's *Flora of Edinburgh* without any sign of suspicion. The very brief introduction to the paper should surely have been more specific on this point. Mr. D. S. Fish's "Notes on the Rarer Woodland Plants of Scotland" are illustrated by excellent plates showing *Moneses*, *Linnæa*, and *Trientalis* in their native surroundings.

We regret to record the death of the Rev. T. A. Preston, of whom a notice will appear in our next issue.

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Antarctic Algae

ANTARCTIC ALGÆ.

By A. and E. S. Gepp.

(Plate 470.)

The following is a list of the marine algæ brought from the South Orkneys by the Scottish Antarctic Expedition, and communicated to us by Mr. R. N. Rudmose Brown. The South Orkneys lie about 45° W. long. and 61° S. lat.; they are therefore situated outside the antarctic circle, and far to the south-east of Cape Horn. No algæ have hitherto been recorded from these islands, so far as we are aware, the nearest being from South Georgia, and described by P. F. Reinsch in Neumayer's *Internationale Polarforschung*, 1882–3: *Die Deutschen Expeditionen*, Band ii. (1890), pp. 366–449.

There are but twelve species in the present list; four of them, however, are new to science, one representing a new genus. One of the species has been recorded hitherto only from South Georgia, and most of the others are known from the Falklands and Cape Horn. Of the four novelties, two were brought back by the British Antarctic Expedition also.

Chlorophyceæ.

1. **Monostroma endiviæfolium**, n. sp. Thallus sessilis, subnigrescenti-viridis, membranaceus, callo vix ullo, mox expansus, maxime et dense crispato-undulatus, haud laceratus, parvus, 2–4 cm. altus et latus, 60–67 μ crassus; cellulis geminis vel quaternis, in sectione thalli transversali verticaliter rectangularibus, angulis rotundatis; cellulis basalibus longissime caudatis.

Hab. Shore pools and exposed at low tide, No. 10, Feb. 4, 1903, Saddle Island, South Orkneys.

The nearest allies of *M. endiviæfolium* are *M. Blyttii* Wittr. and *M. splendens* Wittr. From *M. Blytii* it differs in having an excessively crisped, not lacerate, frond, and in being smaller. Also the cells of *M. endiviæfolium* seen in surface view are more widely separated than those of *M. Blyttii*. From *M. splendens* it differs in colour, in not being coriaceous, in its smaller size, thicker thallus, and longer narrower cells as seen in section.

Reinsch, in his list of South Georgian Algæ (p. 420), quoted above, describes a new variety *macrogyna* of *Ulva Lactuca*. This plant is, he says, composed of a single layer of cells, those at the base being very longly caudate. The former of these characters would place Reinsch's plant in *Monostroma* rather than in *Ulva*. The habit of var. *macrogyna* is, however, quite different from that of *M. endiviæfolium*. It is broad, large and flat like *Ulva Lactuca*, and the size of the cells is much smaller than that of our plant. If we regard var. *macrogyna* as a *Monostroma*, these two plants are the only antarctic species of the genus known to us.

Phæophyceæ.

2. **Lessonia grandifolia**, n. sp. Callus radicalis dense et irregulariter ramosus, coriaceus. Stipes valde compressus, marginibus

obtusis, bis vel ter vel quater dichotomus, subter quamque dichotomiam expansus; rami plano-convexi ancipites marginibus acutis, laxe torti. Stipes totus e callo usque ad laminas 30–120 cm. Laminæ lanceolato-lineares, longissimæ (1–8 metr.), latæ (8–45 cm.), marginibus grosse undulatis integerrimis, apice deleto, fissiles, in sicco coriaceæ sed fragiles. Stipitis substantia lacunis annulisque carens. Sporangia ignota.

Hab. Scotia Bay, South Orkneys, near surface, April, 1904. Also from Cape Adare and Coulman Island, Brit. Antarct. Exped.

L. grandifolia is not one of the dendroid species of *Lessonia*, but is remarkable for its huge laminæ. In habit and structure it is most nearly allied to *L. laminarioides*, but differs from it in being far larger, in having a flat, twisted stipe, and laminæ resembling large fronds of *Laminaria saccharina*. The structure of the lamina is, like that of *Lessonia laminarioides*, composed of three strata—a cortex of small brown cells, a subcortex of larger cells, and a medulla composed of hyphæ mostly running longitudinally. But in *L. grandifolia* the medulla contains a number of scattered "trumpet-hyphæ," resembling those described by Grabendörfer (Bot. Zeit. 43 (1885), p. 645, tab. vi. fig. 11) for *L. ovata*, but, unlike those, enclosed in a sheath of very small cells. In a transverse section of the stipe the medulla is evident to the naked eye as a narrow darker band from end to end of the section. This difference of colour is indistinguishable under the microscope.

3. Adenocystis Lessonii Hook. & Harv. South Orkneys, Bay M, Nov. 1903.

Geogr. Distr. Cape Horn, Falklands, Auckland and Campbell Islands, Cockburn Island, Kerguelen, Tasmania, and New Zealand.

4. Desmarestia Rossii Hook. & Harv. South Orkneys, Bay A, 1–3 fathoms, March 1, 1903.

Geogr. Distr. Cape Horn, Falklands.

It is surprising that the 'Scotia' collections contain no example of the plant called *D. media* in the *Flora Antarctica*, part ii. (1847), p. 466. It is a common species in the south polar region, and well represented in the 'Discovery' collections; but it is not—as Harvey supposed—identical with the northern *D. media* Grev. (*Sporochnus medius* C. Ag.). We have been compelled to rename the southern species D. Harveyana. Our reasons for this will be given in the report on the British Antarctic Expedition.

Florideæ.

5. Acanthococcus spinuliger Hook. & Harv. South Orkneys, Bay A, 9–10 fathoms, May, 1903. Scotia Bay, Dec. 1903.

Geogr. Distr. Cape Horn, Falklands, Punta Arenas.

6. Epymenia sp. South Orkneys, Bay A, 9–10 fathoms, May, 1903.

Two specimens without fruit. They resemble *E. obtusa* in general habit and structure, but they lack the midrib in the base of the flabellate branches. The length of the midrib seems, however, to be a variable character in *E. obtusa*.

7. Plocamium Hookeri Harv. South Orkneys, Bay A, 9–10 fathoms, Aug. 29, 1903; April, 1903; May, 1903.

The last specimen is so covered with diatoms as to be unrecognizable until it is cleaned.

Geogr. Distr. Kerguelen, Heard Island, South Georgia.

8. P. coccineum Lyngb. South Orkneys, Scotia Bay, Dec. 1903. Bay A, 9–10 fathoms, May, 1903.

Geogr. Distr. Cosmopolitan.

9. **Pteridium proliferum**, n. sp. Frons fruticulosa, circa 12 cm. alta, alterne dichotoma (sed ramificatio ob prolificationes copiosas obscura); rami complanati, costati, alati, costa inferne conspicua, superne attenuata, omnino sine venis lateralibus; rami ramulique laciniati, a marginibus costaque prolificantes, alterne et irregulariter dichotomi. Ramuli ultimi membranacei, ligulati vel cuneato-ligulati, usque ad apices obsolete et simpliciter costati, irregulariter lacerati vel grosse dentati, prolificantes. Cellulæ paginales homœocystideæ omnes rotundato-augulatæ. Tetrasporangia sine ordine utroque latere costæ phyllorum parvorum disposita, soros nec in unum confluentes, nec ad apicem attinentes formantia.

Hab. South Orkneys, Bay A, 9–10 fathoms, May, 1903.

We should have preferred to style our plant simply *Delesseria prolifera*, using *Delesseria* in the old wide sense. But that genus, as emended by J. G. Agardh, is now so limited in its scope that we are compelled to refer the plant to *Pteridium*, although we regard it and certain other genera latterly split off *Delesseria* as too nearly allied to be worthy of generic rank. In our species the mode of branching is very much masked by the abundant proliferations. It is in habit most like *P. alata* and *P. pleurosporum*, but differs from the former in being much more irregularly branched, and in having no lateral veins. From *P. pleurosporum* it differs in being very proliferous, and in the sori not being confluent over the costa. The sori, in fact, resemble those of *Hypoglossum denticulatum* as figured in Kützing's Tab. Phyc. xvi. tab. 15, 1 (= *Pteridium spinulosum* J. Ag.). De Toni divides the genus *Pteridium* into three sections, the first of which contains species with a "frons teretiuscula," which our plant has not; the second section has an obsolete costa; and the third shows a difference in the form and disposition of the cortical cells, which cover the costa and the frond, when seen in surface view, besides having lateral veins. Our plant therefore falls into none of these sections. It may be thought that *P. proliferum* approaches more nearly to *Hypoglossum*; but from that genus it differs in being *branched*, as well as proliferous. From *Erythroglossum* it differs in having proliferations emerging from the costa, and in the similarity in form and size of the cortical cells of costa and frond. It differs from Reinsch's *Delesseria condensata* in having a much less strongly marked costa, and in being proliferous.

10. Pteronia pectinata Schmitz (= *Polysiphonia pectinata* Hook. & Harv.). South Orkneys, Scotia Bay, Dec. 1903.

Geogr. Distr. Cape Horn, Falklands, South Georgia.

Reinsch (*l. c.* p. 374), in his note on this plant, says he believes

it had never been figured. But he had overlooked the coloured figure in Harvey's *Nereis Australis*, tab. xxvii., which represents part of the thallus of a specimen from the Falklands collected by Mrs. Sullivan, preserved in the Royal Herbarium, Kew, where there is an original drawing showing the structure, habit, and cystocarp.

11. PTILOTA CONFLUENS Reinsch. South Orkneys, Scotia Bay, Oct. 1903. Three incomplete plants, without fruit.

Geogr. Distr. South Georgia.

This species is described and figured by Reinsch (*l. c.* p. 376, tab. iii. figs. 5–9). His figure of a portion of the frond, being reduced to one-third its natural size, is not very helpful in determination. The figures of the structure, combined with the clear diagnosis and remarks, are, however, enough to enable us to recognize our plant as *P. confluens*. Reinsch remarks that the axillary cell in his specimen has almost disappeared. In our plant it is still quite clear.

Leptosarca, n. gen.

Frons plana, membranacea, simplex aut ramosa (prolificationes exserens), stratis duobus contexta : cellulis interioribus paucis maximis submonostromaticis inanibus leptodermis siccitate collapsis, cellulis corticalibus monostromaticis, endochromate denso roseo-rubro repletis. Fructus et sporangia ignota.

12. **L. simplex**, n. sp. Frons simplex, oblongo-lanceolata, inferne in stipitem angustatam attenuata, margine sparse undulata, 14–22 cm. longa (apice incompleta), 1·5–4·0 cm. lata, 230 μ crassa.

Hab. South Orkneys, shores of Bay C, No. 24 B, March 26, 1903.

This genus is founded purely on vegetative characters, which are so strongly marked as to separate it from all existing genera. The distinctive feature is its structure, and this points to an affinity with *Tyleiophora* and *Gracilaria*, but from these *Leptosarca* is at once distinguished by its extreme thinness and its monostromatic cortex. The walls of the great interior cells are very thin, except at the margin of the thallus. In order to see these interior cells it is indispensable to examine fresh or pickled material, since in dried specimens the whole of this inner stratum is found to be entirely crushed and unrecognizable. We failed in all our efforts to make this compressed tissue open out sufficiently even to show whether it was composed of cells or filaments. In dried specimens the genus may be recognized by the unusually large coloured angular cells which compose the cortex, and are arranged almost always in a single layer.

Another species, L. DUMONTIOIDES (= *Halosaccion dumontioides* Harv.), brought back in the 'Discovery,' will be described in the Report on the British Antarctic Expedition.

In certain parts of the frond of *L. simplex* we find small filaments creeping round the cell-walls. Reinsch (*l. c.* p. 413, tab. xv. figs. 11–13) records two species of *Entonema* from South Georgia, endophytic in other algæ; but our plant does not agree with these, nor indeed with any other species of the genus. We have only the vegetative

filaments of our endophyte, and we hesitate, therefore, to give any definite opinion on it. Since, however, the algæ from South Orkneys are few and interesting, it is worth while recording it, as it may occur among other antarctic collections.

13. **Phyllophora antarctica,** n. sp. Frons e stipite brevi mox in laminam membranaceam ligulatam sæpius opposito-sinuatam simplicem vel dichotomam expansa, ramis approximatis et ad apicem et secundum margines prolificantibus; cystocarpiis marginalibus pedicellatis; tetrasporangia ignota.

Hab. Coulman Island, off Cape Wadsworth, *British Antarctic Expedition.*

The lamina is about 1 cm. wide, and may attain a length of 15 cm. This species was not found by Mr. Rudmose Brown. It will be treated of more fully among the 'Discovery' algæ.

Description of Plate 470.

Monostroma endiviæfolium, n. sp. — Fig. 1. Portion of plant, nat. size. 2. Caudate basal cells, seen in surface view, × 150. 3. Ditto, seen in longitudinal section, × 150. 4. Upper part of thallus, transverse section, × 150. 5. Ditto, surface view. *a*, showing cells in twos and fours shortly after division; and *b*, when they are more evenly distributed, × 150.

Lessonia grandifolia, n. sp.—Fig. 6. Longitudinal section of lamina, showing central strand of hyphæ, with one "trumpet-hypha" in longitudinal, and one in transverse view.

Pteridium proliferum, n. sp.—Fig. 7. Branch showing proliferations from margin and midrib, nat. size. 8. Tetrasporic branchlet with growing points, and showing, not cortex, but interior tissue, × 30. 8*a*. Apex of lobe, surface view, × 150. 9. Tetrasporangia, surface view, showing their subcortical position, × 350.

Leptosarca simplex, n. gen. et sp.—Fig. 10. Plant with eroded apex, nat. size. 11. Transverse section of thallus. *a*, taken from margin, showing thick-walled cells; *b*, taken from middle of frond, where the cells have much thinner walls. In *b* may be seen filaments of *Entonema* creeping over the cell-walls, × 150.

ATLANTIC ALGÆ OF THE 'SCOTIA.'

By A. and E. S. Gepp.

The following algæ were collected by the Scottish Antarctic Expedition in tropical and subtropical waters off the coast of Brazil, at St. Paul Rocks and St. Vincent, Cape de Verde.

1. *Ulva Lactuca* L. St. Vincent, Station 24, Dec. 1, 1902.

Geogr. Distr. Cosmopolitan.

2. *Chætomorpha* sp. A fragment. Between Rio and Bahia, off the coast of Brazil, "Station 81, Dec. 20, 1902. Lat. 18° 24′ S. Long. 37° 58′ W."

3. *Microdictyon umbilicatum* Zan. Off Brazil, same locality as No. 2.

Geogr. Distr. Mediterranean, Warm Atlantic, Warm Pacific, Indian Ocean, Red Sea.

4. *Bryopsis pennata* Lam. St. Paul Rocks, Station 53, Dec. 10. 1902. Surface.

Geogr. Distr. Warm Atlantic, Indian Ocean.

5. *Caulerpa racemosa* J. Ag. var. *lætevirens*, forma *cylindracea* Web. v. B. St. Paul Rocks, Dec. 10, 1902, lat. 0° 58′, long. 29° 20′, Shore.

Geogr. Distr. Warm Atlantic, Indian Ocean, Australia.

Var. *uvifera* Web. v. B. Station 81, off Brazil, same locality as No. 2.

Geogr. Distr. West Indies, Indian Ocean, Friendly Islands.

6. *C. Murrayi* Web. v. B. Station 81, off Brazil, same locality as No. 2.

Geogr. Distr. Victoria Banks, Brazil.

7. *Codium tomentosum* Stackh. Off Brazil, same locality as No. 2.

Geogr. Distr. Mediterranean, North Atlantic, Cape of Good Hope, Indian Ocean, Red Sea, North Pacific, Australia.

8. *Sargassum vulgare* Ag. Off Brazil, same locality as No. 2. St. Vincent, shore, Station 24, Dec. 1, 1902.

Geogr. Distr. Warm Atlantic.

The first record consists of fragments of plants with few and widely scattered leaves. The second specimen has many and crowded leaves, which are smaller than those of the Brazil specimens. The St. Vincent plants agree exactly with specimens collected by the 'Challenger' from the same locality, and preserved in the herbaria of the British Museum and the Royal Gardens, Kew.

9. *Gymnosorus variegatus* J. Ag. Two specimens without fruit. Off Brazil, same locality as No. 2.

Geogr. Distr. Warm Atlantic, Warm Pacific, Red Sea.

10. *Stypopodium lobatum* Kütz. Five specimens, without fruit. Off Brazil, same locality as No. 2,

Geogr. Distr. Canaries, West Indies, Chatham Island.

11. *Dictyota dichotoma* Lam. Off Brazil, same locality as No. 2.

These plants show a variation from the ordinary type, inasmuch as the two branches of the final dichotomy take on the narrow form characteristic of f. *intricata*. Below this final dichotomy the plants are quite typical, and the change is a sudden one. Mr. Lloyd Williams has been so kind as to give us his opinion on one of the specimens, saying that this development is probably the result of unfavourable environment at a late stage of growth. He adds that he is able to bring about such a change artificially in laboratory cultures.

12. *Gelidium corneum* Lam. Two specimens without fruit. Also two fragments attached to *Sargassum vulgare*. St. Vincent, Station 24, Dec. 1, 1902. Shore.

Geogr. Distr. Cosmopolitan.

13. *Cryptonemia luxurians* J. Ag. Off Brazil, same locality as No. 2.

Geogr. Distr. Brazil, Martinique.

MYCETOZOA FROM NEW ZEALAND.

By A. and G. Lister.

We have been favoured with the following graphic notes by Miss Hibbert-Ware on the Mycetozoa collected by her in New Zealand during her three months' visit to the islands from January to March, 1904 :—

"Most of the Mycetozoa described in this paper were gathered from the 'Bush' of New Zealand, and those of Stewart Island belong to the truly primeval forest, for in this most southern of the three islands the indigenous trees are still untouched by the hand of man, and the introduced plant has hardly yet appeared. Having collected the species, I at once forwarded examples of them to Mr. and Miss Lister, who have examined and identified them.

"*Ceratiomyxa mucida* was the first species I found, in Ross's Creek, a beautiful remnant of ancient Bush near Dunedin. It abounded both there and in Stewart Island.

"The ubiquitous species of the country is *Trichia verrucosa*. It occurred invariably, even off the coast of Stewart Island, on the tiny islets, so densely covered with Bush that we could with difficulty clamber up their banks. We found it generally on wood, which was so soft and saturated with water that we feared it must go to mould. But at New Plymouth we came across it on tree-stumps, exposed at the edge of a hill. *Trichia Botrytis* var. *lateritia* is almost equally abundant, and occurs under very similar circumstances to the last species.

"The genus *Stemonitis* ranks also among the very first in abundance. We found *S. ferruginea* in Stewart Island, and *S. fusca* almost everywhere along the Bush tracks. But we searched in vain for them or any other Mycetozoa on the trunks of the tree-ferns, which lie in all stages of decay on the floor of the Bush.

"I found the new species, *Physarum dictyosporum*, in the dim light of the thick Bush of Stewart Island. Here the tree-fern, crimson-flowered 'rata' (*Metrosideros*), *Dracophyllum*, &c., with the thick undergrowth of moss, fern, and lichen, form a perfect jungle. The supple-jack liane (*Rhipogonum scandens*) spreads from tree to tree and hangs down in rope-like festoons, constantly tripping up the most wary traveller, together with, alas! his over-full collecting-box. I fear that much of *P. dictyosporum* I had gathered may have been left behind during my six or eight falls on this occasion, when we were so richly rewarded for venturing beyond the beaten track. It was also on this expedition only that we found *Physarum viride* and *Cribraria aurantiaca*.

"There seemed to be very few species which form their sporangia on fallen leaves. *Diachæa elegans* covered a large tract, chiefly of fuchsia leaves (one of the few deciduous trees of the country), in the Dunedin Bush. *Didymium effusum* and *Physarum nutans* occur but sparingly in the parts I visited. At Geraldine, in Canterbury, the essentially English part of the colony, the character of the Mycetozoa seemed different. Here enormous

æthalia of *Fuligo septica* and large masses of *Stemonitis splendens* var. *flaccida* were conspicuous on the willow-trunks. In the Bush, *Didymium farinaceum* and *Physarum compressum* were abundant on the moss. *Arcyria punicea* and *flava* occurred here, as in most other parts.

"In the North Island, at New Plymouth, an old tree-trunk in the Botanic Gardens yielded *Trichia verrucosa* and *Dictydium umbilicatum*. At Eltham, a new township not many miles away, the felled trunks of the great Bush trees found along the sides of the main road gave rich yields of *Physarum citrinum*, *Cribraria intricata*, and *Tubulina fragiformis*. *Lycogala miniatum* shows its pink and brown æthalia in all parts of the Bush."

Miss Hibbert-Ware collected thirty-five species of Mycetozoa, one of which is new to science. The following is the list of the species she submitted to us:—

Ceratiomyxa mucida Schroet. Dunedin, New Plymouth, and Stewart Island.

Physarum globuliferum Pers. Stewart Island.

P. citrinum Schum. Eltham, North Island.

Physarum dictyospermum, n. sp. Sporangia subglobose, shortly stipitate, erect, scattered, 0·5 to 0·6 mm. diam., dull orange or dark olive-brown, glossy; sporangium-wall membranous, rather firm, mottled with orange and beset with scattered innate lenticular crystalline bodies, about 16 μ diam., such as are found in the sporangium-wall of *P. psittacinum*; these show as pale yellow spots on the unbroken sporangium, and are orange in transmitted light. Stalk usually slender, 0·1 to 0·5 mm. high, expanding below into the scanty hypothallus, black, or sometimes pale yellow above from deposits of lime granules; when mounted in glycerine the wall of the stalk is seen to be dark chestnut brown, and to enclose granular refuse matter. Columella conical or hemispherical, short or reaching to one-third the height of the sporangium, nearly black. The capillitium radiates from all parts of the columella, and consists of an abundant persistent network of slender colourless or pale yellow threads, with small fusiform orange-red lime-knots; one of the sporangia examined shows knotted irregular purple-black threads mixed with the colourless capillitium, but this no doubt is an abnormal development. Spores brownish-purple in mass, pale purplish-grey when highly magnified, 10 to 11 μ diam., closely reticulated with narrow dark bands; these form a net with five to six regular meshes across the hemisphere on one side; on the other side the meshes are more faint and irregular.

Hab. On rotten wood, Stewart Island.

The specimen consists of twenty-seven sporangia, whose colour resembles the dark wood on which they have developed so closely that they are very inconspicuous.

This *Physarum* is sharply separated from other known species of the genus by the strongly reticulated spores, which recall those of *Stemonitis trechispora* Berk. Its nearest ally is perhaps *P. psittacinum*, which it somewhat resembles in the structure of the glossy

sporangium-wall studded with crystalline discs, and in the translucent orange lime-knots.

P. Berkeleyi Rost. Stewart Island.
P. viride Pers. var. *luteum*. Stewart Island.
P. nutans Pers. *β. genuinum*. Stewart Island.
P. calidris List. Stewart Island.
P. compressum A. & S. Geraldine.
P. cinereum Pers. Geraldine.
Fuligo septica Gmel. Dunedin and Geraldine.
Craterium pedunculatum Trent. Dunedin.
Diachæa elegans Fr. Dunedin.
Didymium effusum Link. Dunedin and Stewart Island.
D. farinaceum Schrad. var. *genuinum*. Geraldine and Stewart Island.
Stemonitis herbatica Peck. On wood, Eltham.
S. fusca Roth. Dunedin and Stewart Island. One of the specimens from Dunedin shows the weak columellæ and almost complete absence of surface-net characteristic of the var. *flaccida*, previously found in England.*
S. ferruginea Ehr. Dunedin, Eltham, and Stewart Island.
S. splendens Rost. var. *flaccida*. Geraldine. This form is a link between var. *flaccida* and var. *Webberi*, having the weak columellæ of the former, and the more perfect surface-net of the var. *Webberi*. The large developments of collapsing sporangia, referred to by Miss Hibbert-Ware, reminded her strongly in the field of weathered æthalia of *Reticularia Lycoperdon*.
Comatricha typhoides Rost. var. *α*. Dunedin and Stewart Island.
Cribraria aurantiaca Schrad. Stewart Island. Minute sporangia 0·15 to 0·3 mm. diam., on long slender stalks.
C. intricata Schrad. Eltham. The sporangia vary in different parts of the same gathering; in some the nodes are dark and prominent with small plasmodic granules, and with many "free rays," in others the nodes are flat with few free rays, and resemble those of *C. tenella*. The cups are very slightly developed.
Dictydium umbilicatum Schrad. var. *α*. Eltham.
Reticularia Lycoperdon Bull. Dunedin.
Tubulina fragiformis Fr. Eltham.
Trichia affinis De Bary. Stewart Island.
T. verrucosa Berk. Dunedin, New Plymouth and Stewart Island.
T. persimilis Karst. Dunedin and Stewart Island.
T. fallax Pers. Dunedin and Stewart Island.
T. Botrytis Pers. var. *lateritia*. Dunedin and Stewart Island.
Arcyria punicea Pers. Eltham and Dunedin.
A. incarnata Pers. Stewart Island.
A. flava Pers. Eltham.
Lycogala miniatum Pers. Stewart Island, &c.

Besides the above-named specimens obtained by Miss Hibbert-Ware, we have received from Mr. George Hodgkin three further

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* See Journ. Bot. April, 1899, p. 149.

species gathered by him in New Zealand near Lake Taupo, North Island, in the latter half of the year 1902:—

Craterium leucocephalum Ditm.
Arcyria albida Pers.
A. ferruginea Saut.

SOME FORFARSHIRE PLANTS.

By Rev. E. S. Marshall, M.A., F.L.S., & W. A. Shoolbred, F.L.S.

We spent a fortnight from June 23rd last at Clova, and two or three days at Arbroath. The season being backward, our visit was too early for alpine work; still, a few novelties were obtained, those which appear to be county additions being starred. Our best thanks are due to Mr. Arthur Bennett, Prof. E. Hackel, Mr. F. J. Hanbury, Pfarrer G. Kükenthal, Revs. E. F. and W. R. Linton.

Fumaria densiflora DC. Cornfield on the outskirts of Arbroath.

**Cochlearia micacea* E. S. Marshall.—The well-known little Cullannoch plant (erroneously referred by Prof. J. Lange to *C. danica* L. in 1888) proves to be this, just like the Ben Lawers form; fruiting specimens sent by Mr. A. Somerville have the pods smooth, not reticulate-veined as in *C. alpina*.

**Viola ericetorum* × *Riviniana*.—Glen Clova, in two stations about three miles apart.

**Ulex Gallii* Planch.—Near Arbroath; our specimens, gathered on the edge of a dry wood, have remarkably weak primary spines.

Astragalus glycyphyllus L.—Coast, about two miles north-east of Arbroath.

Geum rivale × *urbanum* (*G. intermedium* Ehrh.). Near the last, in a deep ravine; very variable.

Rosa rubiginosa L.—With the *Astragalus*, apparently native.

Saxifraga nivalis L.—Corrie Bonhard, Clova.

Galium Cruciata Scop.—Coast near Monifieth; very local.

Matricaria discoidea DC.—Outskirts of Arbroath, established in good quantity at one spot.

Hieracium Pilosella L. var. *nigrescens* Fr.—Frequent in the Clova Valley.—Var. *pseudopilosella* (Ten.).—Coast, Arbroath to Monifieth. The Canlochlan Glen plant, issued as var. *nigrescens*, is this eglandular-headed form, which Fries (*Epicrisis*, p. 12) clearly distinguished from the other, ranking it as a subspecies.—Var. **concinnatum* F. J. Hanb.—Steep slopes in Glen Fiagh, at 2300 ft.

H. Marshalli Linton.—Corrie of Clova.

H. chrysanthum Backh. var. *microcephalum* Backh.—With the last: also in a corrie facing north-east, above the upper S. Esk, accompanied by *H. rotundatum* Kit.

**Euphrasia latifolia* Pursh.—Cliffs near Arbroath; a glandular form, not so densely clothed with white hairs as in the far north. *E. brevipila* was the only eyebright seen in flower at Clova.

**Betula intermedia* Thomas.—One fine tree, by a streamlet not

far from Bachnagairn, at 1400 ft. Distinguishable from its neighbours at a considerable distance by its round bush-like outline, dense branches, and darker foliage. This case practically proves the correctness of the opinion expressed in this Journal (1900, p. 271), that *B. intermedia* was *nana* male × *pubescens* female; for here *pubescens* is abundant, whereas *nana* only occurs higher up the valley. Just like the Glen Callater plant of 1886.

**Salix Caprea* × *Lapponum*.—Riverside, between Loch Esk and Bachnagairn, in two forms; the first a tall bush, 5-6 ft., much nearer *Lapponum*; the second a small tree, 8–10 ft., more intermediate.

S. eugenes Linton.—We were fortunate in finding what is probably the original bush, in good fruit; from the conditions of its locality, it is almost certainly a result of female *S. herbacea* × *Lapponum* being fertilized by male *S. Myrsinites*.

**Habenaria conopsea* × *Orchis ericetorum* Linton.—Near Braedoonie; a single specimen. Like *H. conopsea* in fragrance, narrow inflorescence and long slender spur; leaves spotted, but narrower than in *O. ericetorum*, which is the only form of aggregate *O. maculata* that we have observed in the Highlands.

Allium oleraceum L.—Coast, north-east of Arbroath.

Carex curta Good.—A plant from swamps below Corrie of Clova (2000 ft.) is named by Herr Kükenthal "*C. canescens* L. var. *fallax* F. Kurtz (simulating *C. brunnescens* Pers.)." This, however, is only a synonym of *C. canescens* var. *dubia* L. H. Bailey in Bot. Gaz. ix. p. 119 (1884), to which a good deal of British "*alpicola*" probably belongs. Prof. Bailey's description runs:—"Culm stiff, 1° high, longer than the long pointed leaves; spikes 3-6, all approximate, oblong, 10-20-flowered, light tawny; perigynium gradually narrowed into a beak half or more as long as the body, minutely rough on the angles above, nerved, about the length of or a little longer than the scale. *C. helvola* Blytt? Carex Cat. Bear River Canon, Utah (No. 1231a, King's Survey); perhaps also the 1018 of Wheeler's Survey from Twin Lakes, Colorado. The variety differs from *C. canescens* in its stiffer culm, mostly shorter leaves, oblong and tawny approximate spikes, and in the characters of the perigynium. Much resembling the European *C. helvola*, itself a doubtful species, but differing in its narrower scales and its nerved and rough-angled perigynium." Kükenthal (in Engler's Bot. Jahrb. xxvii. p. 509, 1899), who identifies "var. *fallax* Kurtz, m.s." with Prof. Bailey's var. *dubia*, adds to the localities: "Sudeten, Carpathen, Centralpyrenäen, Hochschottland (Ben Lawers), Grönland, Nordamerika alp. (Wahsatch Mts.)," and Argentina, and says that it is an alpine form, tending towards *C. vitilis*. A second gathering, collected at 1000 ft. below Corrie Bonhard, is called by Kükenthal "*C. canescens*, forma *tenuis* Lang"; apparently the same thing, but too young for identification, grew above the corrie at 2700 ft. This would be more correctly cited as var. *tenuis* O. F. Lang in *Linnea*, 1851, p. 538. Lange, Haandb. Danske Flora, ed. 4, 127, gives the following description:—"More slender, with rougher stem and narrower and more flaccid leaves; spikelets hardly half as large as

those of the type, the lowest often surrounded by a leaf-like bract," and considers it an intermediate between *canescens* and *vitilis*. On the evidence of the examples before us, we are inclined to think that the two names really cover only one form; if this is the case, Lang's will supersede the other.

C. aquatilis Wahl.—The alpine plant (var. *minor* Boott) is identified by Kükenthal with var. *sphagnophila* Fr., an older name. Var. *elatior* Bab. is the type, or what comes nearest to it in Britain.

**C. aquatilis* × *Goodenowii*.—Swamps below Corrie of Clova, a good intermediate; sparingly by the river at Clova, nearer *aquatilis*. Mr. Bennett writes that this hybrid is identified with *C. aquatilis* var. *epigeios* Laest. by Almquist & Hjelt, Fl. Fennica, i. 270.

**C. Goodenowii* × *rigida*.—Peaty swamp above Glen Canness; also by the White Water, at 2300 ft. in two very different forms. One inclines towards *Goodenowii*; Kükenthal says of the other:—"Is a very critical plant. The whole habit is that of a *Goodenowii* × *rigida*, but the fruits are as in *rigida*. In spite of fertility, I accept that crossing, in the *forma super-rigida*."

C. panicea L. var. **tumidula* Laestad.—Swamp in Glen Clova; plentiful and characteristic.

C. hirta L. var. **spinosa* Mort.—Sandy coast near Monifieth; a striking variation, with long-awned glumes (up to fully ½ in.). It was locally abundant, and we saw no specimens of the type with it.

C. rostrata Stokes × var. **robusta* Sonder (sub *ampullacea*).—Glen Clova, about three miles below the inn, in a pool of peat-water. Very strong and tall; the female spikelets mostly male at the top, and *vice versa*. Lange (Haandb, ed. 4, p. 150) gives this definition:—"3–4 feet high, with broader and flatter leaves, 3–5 male spikelets, female spikelets stouter (often male at the top), larger fruits." We learn from Mr. Bennett that vars. *elatior* Blytt and *latifolia* Asch. are later synonyms. Irish plants closely approach this gathering from Clova; but in our herbarium specimens their male spikelets are not female at the top.

Poa Balfouri Parn.—Sparingly in Glen Doll and Corrie Bonhard; too young for certainty, but probably var. *montana* (Parn.)

**Glyceria declinata* Bréb. On dried-up mud near Barry Station.

G. fluitans R. Br. var. **triticea* Fr.—Abundant by the S. Esk, just above Clova Bridge. Prof. Hackel remarks:—"Ascherson & Graebner call this form var. *loliacea*, because they identify *Festuca loliacea* Huds (1762) (non Curt.) with this plant."

Festuca rubra L. subvar. *grandiflora* Hack.—Sandy coast, Carnoustie and Monifieth; also collected near Arbroath. Subvar. *pruinosa* Hack.—Cliffs near Arbroath, abundant.

Bromus mollis L. var. *microstachys* Duval-Jouve.—Sown grass-field in Glen Clova. Very like *B. brachystachys* Hornung in habit.

Agropyron junceum × *repens*.—Sandy bay, north-east of Arbroath. "*A. acutum* Auct. (Reichb.), non D.C., *Triticum laxum* Fr." Hackel *in litt.*

NEW AND RARE BRITISH HEPATICÆ.

By Symers M. Macvicar.

Marsupella Boeckii (Aust.) Lindb. *Sarcocyphus Boeckii* Aust. in Bull. Torrey Bot. Club, 3, p. 9 (1872). When on Ben Nevis, last July, I found a plant on wet rocks near the Red Burn, at 2600 ft. alt., and near the source of this burn, at 3600 ft., which appeared to me identical with this species, after comparing it with authentic specimens from Norway. I sent specimens from both localities to Herr Kaalaas, who replied that they were certainly *M. Boeckii*. When sending them, I stated that I could not see how they were to be separated as a distinct species from our *M. Stableri* Spruce. He agreed that the two plants were closely allied, but thought that they showed some differences, and that it would be better to treat them as distinct at present. He added, however, that he had only a limited knowledge of Spruce's plant. I had no doubt of the identity of the two, and sent the Ben Nevis specimens and Norwegian specimens of *M. Boeckii*, gathered by Herr Kaalaas, to Mr. Pearson, who, after examination, agreed that all the specimens were without doubt the same species as *M. Stableri*. The Ben Nevis plant is a rather smaller form than is usual with *M. Stableri*, as was to be expected from the altitude at which it occurred. Herr Kaalaas has been convinced for some time of the identity of *M. filiformis* Lindb. with *M. Boeckii*. As far as sterile specimens allow one to judge, there certainly does not appear to be any difference between the two; in fact, I labelled one of the Ben Nevis specimens sent to Kaalaas as *M. filiformis*, but mentioned that it was the same species as the other. *M. Boeckii* does not appear to have been found elsewhere than in Scandinavia and Britain. As Austin's name has several years' priority over Spruce's, *M. Stableri* must be considered a synonym.

M. Pearsoni Schffn. MS. This new species was discovered by Mr. Pearson in Borrowdale, Cumberland, in April, 1893, and by him in 1904 in Rossett Ghyll, Westmoreland, and on Snowdon. Mr. Charles Scott has also found it on the Kilmun Hills, Argyllshire, Oct. 1904. It resembles *M. emarginata* in size and habit, but is readily distinguished from that species by its shiny leaves, which are round, with the sinus broad and shallow, sometimes scarcely apparent; lobes round or with an apiculus; cells with very strongly thickened walls, which give them a guttulate appearance. The original gathering was growing among the lax form of *Anthelia julacea*. Mr. Pearson mentions that the plant grows on exposed rocks in somewhat swampy places at about 1000 ft. altitude.

Nardia Breidleri (Limpr.) Lindb. *Alicularia Breidleri* Limpr. in Jahresb. Schles. Ges. vaterl. Cult. 57, p. 311 (1880). I found this rare alpine addition to our flora last July on Ben Nevis, on bare moist soil, alt. 3600 ft. It was accompanied with *Gymnomitrium varians* (Lindb.) and *Anthelia Juratzkana* (Limpr.), with the mosses *Polytrichum sexangulare*, *Dicranum falcatum*, *Rhacomitrium fasciculare*, and *R. heterostichum*, for the names of which

I am indebted to Mr. W. E. Nicholson. This very distinct but minute species forms reddish brown patches, which are apt to be overlooked, but it has a different facies from any other of our alpine species. Under the microscope it cannot be mistaken for any other; the presence of under leaves on the stems combined with the absence of oil-bodies in the leaf-cells will distinguish it, even when sterile. When fertile, it agrees only with *Nardia minor* (Nees) in having a gibbose rooting involucre. Perianths were present in the Ben Nevis plant. This species has been found in many places in Norway from 300 metres in Nordland up to the limits of vegetation; and extending to Tromso (*Kaalaas*); also in Siberia, the Austrian Alps, and in the Province of Como at about 2000 metres. Specimens from the last locality as well as from Norway are represented in Schiffner's Hep. Eur. Exs. Nos. 51–53. Limpricht's description of the species will also be found in Lindb. & Arnell's Musc. Asiæ bor. p. 61, and in Kaalaas's De Dist. Hep. in Norveg. p. 398. Regarding these small alpine species, it may be mentioned that *Gymnomitrium varians* occurs in abundance on the summit plateau of Ben Nevis; that is as far as any plant can be said to occur in abundance on that bare locality. It forms the highest vegetation in any quantity in Britain, there being large patches of it within a few yards of the summit cairn.

Sphenolobus exsectus (Schmid.). This is a much rarer plant in Britain than *S. exsectæformis* (Breidl.). The only specimens of it which I have seen from our islands have been from the West Highlands, in the Loch Lomond valley, Argyll, and West Inverness. In each case it occurred on stumps or decaying logs in moist sheltered places. It doubtless occurs in similar localities in other parts of Britain. The plant of exposed places on stumps or on banks has always been *S. exsectæformis*, but the latter also is found in similar places to the former. The two plants are closely allied, but I have never found any difficulty in separating them.

Lophocolea heterophylla (Schrad.) var. paludosa Warnst. This variety closely resembles in habit *Chiloscyphus polyanthos* var. *pallescens*, and is perhaps frequently overlooked in the field on this account. The species, frequent enough in the south, is one of the rarest plants in the Highlands of Scotland. In the West Highlands north of the Clyde area it has been found only as this variety in a few places in marshy ground. It can be distinguished in the field from *Chiloscyphus* by its different under leaves, the terminal inflorescence, and usually by the dimorphic leaves, though *Chiloscyphus* has frequently some which are emarginate. In the latter plant, also, the characteristic male bracts are very frequently present. The variety is described in Warnstorf's Krypt. Flor. d. Mark. Brandb. p. 248.

Odontochisma denudatum var. elongatum Lindb. This is a well-marked deviation from the type, and resembles *O. Sphagni* in habit. It occurs in large brown spreading masses in marshy ground on the hills in Perthshire, with such plants as *Hypnum rufescens*. It can be distinguished from *O. Sphagni* by its stellate leaf-cells, and by the usual presence, at least in the Scottish speci-

mens, of large under leaves. It also grows in quite a different kind of situation. This variety was found in July, 1903, in the western ravine of Ben Lawers, at 2700 ft. alt., by Mr. P. Ewing; and in the following year by myself on Ben Laoigh, and in Coire Ardran, at 2200 ft.

KANTIA SPHAGNICOLA Arnell & Persson in Rev. Bry. p. 26 (1902). This addition to our flora was found by Miss K. B. Macvicar in a peat moss near Carr Bridge, East Inverness, Oct. 1904. The determination has been confirmed by Drs. Arnell and Schiffner. An interesting plant, much smaller than *K. trichomanis*. It occurred in small patches on the top of *Sphagnum*, and as scattered stems among it, having much the appearance to the naked eye of the similar growing *Cephalozia connivens*, and being not much larger. A submerged plant which the Rev. David Lillie found in 1903 in a *Sphagnum*-moor near Watten, Caithness, may be this species, but he has not been able, so far, to find more than a few sterile stems. The Carr Bridge plant has perigynia, and is autoicous, as in the original description of the species. Prof. Schiffner found it in Riesengebirge last year, and has also determined his plant to be autoicous. In connection with the inflorescence in this genus, an important paper by Prof. Douin in Rev. Bry. 1904, p. 105, should be consulted. In it an exhaustive account is given of the inflorescence of *Kantia trichomanis*.

SCAPANIA NEMOROSA (L.) f. ULIGINOSA Jensen MS. This tall, reddish, marsh plant is widely distributed in the Highlands. I have seen it from Argyll, West Inverness, West Ross, and Kincardine. It is widely distributed in Europe. The distinctly papillose cuticle of the leaf-cells entitles it, perhaps, to varietal rank.

S. PALUDOSA C. Müll. Frib. Bull. l'Herb. Boiss. p. 40, pl. 1 (1903). *S. undulata* var. *paludosa* C. Müll. Bot. Centralbl. 1901. I have identified this species as British from the following specimens:—*Aberdeenshire.* Braemar, July, 1856 (*A. Croall*).—*Forfarshire.* Clova, 1876 (*J. Fergusson*): Canlochan, 1904 (*Ewing & Young*). — *Perthshire.* Schiehallion, 1882 (*B. Carrington*). — *East Ross-shire.* Ben Wyvis, probably, 1872 (*T. Barker*); Scuir-na-Lapaich, 1904 (*Ll. J. Cocks*). The specimens were under the name of *S. undulata* or *S. uliginosa*. Whether the plant is rare, or not, on our hills is yet unknown. I searched for it last year without success in the Tyndrum district of Perthshire and in West Inverness, but, as with some other species, it may be difficult to recognize in the field until it has once been seen *in situ*. It is also doubtful whether it is to be considered as an alpine or subalpine species with us, though present indications rather point to the former. The only altitude which I have is that by Mr. Cocks, who writes that the plant occurred at about 3000–3200 ft., in the zone of *Pallavicinia Blyttii*. The chief points to be remembered when searching for it are, that it is a marsh plant, growing in large grass-green or yellow-green masses, is very flaccid, and has the keel of the leaves strongly arched. The position of the plant is rather doubtful. It combines some characters of *S. undulata*, *irrigua*, and *uliginosa*. I am inclined to think it nearer *S. irrigua* than the others. Herr Müller is pro-

bably right in making a species of it, as it is difficult otherwise to know where to place it. It is widely spread in Europe, and has been found in New Hampshire, U.S.A., by Prof. A. W. Evans. Messrs. Ewing and Young found a form, as well as the typical plant, in Canlochan, which may be the var. *vogesiaca* C. Müll., but I have not seen an authentic specimen of this variety.

When writing this note, I have received the current number of the *Revue Bryologique*, No. 1 (1905), in which is described a new species of *Scapania* by Dr. Arnell, under the name *Martinellia obliqua*. It is stated to be allied to *S. paludosa* and *S. irrigua*.

THE NATIONAL HERBARIUM.

[The following account of the earlier collections preserved in the National Herbarium was written by Mr. Britten for the "History of the Collections contained in the Natural History Departments of the British Museum" (reviewed in this Journal for 1904, p. 356), and is prefixed to the alphabetical list of contributors prepared by him for the same work. It is reprinted here in the belief that it will be interesting to a large number of readers to whom the detailed "History" will not be accessible.—Ed. Journ. Bot.]

I.—General Sketch.

The Department of Botany, originally styled the Banksian Department, was established for the reception of the herbarium of Sir Joseph Banks, who had, shortly before his death in 1820, bequeathed it to Robert Brown, at whose demise it was to become the property of the British Museum: with Brown's consent, the herbarium might be removed to the Museum during his lifetime. In the first Report of the Banksian Department, dated 7th December, 1827, Brown says that he has superintended its removal, and was then engaged arranging it. The following memorandum as to the contents of the herbarium was submitted to the Trustees in 1834:—

"The Banksian general herbarium, contained in cabinets consisting of sixty-seven cubes having eight drawers each, is arranged according to the Linnean system, and by means of alphabetical and systematic indexes it may be consulted without difficulty. The number of species in this arranged herbarium is 23,400, of which 20,856 are phanerogamous and 2544 cryptogamous plants; the specimens of many, however, being more or less incomplete. Connected with the general herbarium there is a collection of fruits and seeds, systematically arranged and contained in 64 drawers. There is also a collection of flowers and fruits, chiefly of the more rare or of succulent plants, preserved in spirits, and contained in 326 bottles. One of the presses contains 67 large specimens, chiefly parts of fructification, fronds, and sections of trunks of palms. A cabinet of four cubes contains several partial [special] collections, which, being the authentic materials of important botanical works, are kept separate, particularly Clifford's herbarium, the principal authority

for the plants described in one of Linnæus's earliest and most celebrated works; Clayton's herbarium, from which Gronovius's *Flora Virginica* was entirely formed; a considerable number of plants collected in the Levant by Tournefort and described in the 'Corollarium' to his *Institutiones Rei Herbariæ*, and others sent from Cochin-China by Loureiro, and published in the flora of that country. [There are] also, in five large folio volumes, the herbarium and drawings of Hermannus, chiefly of Zeylan plants, of which the *Flora Zeylanica* of Linnæus is a systematic enumeration and description. The unarranged collections and duplicates consist of 1700 parcels. The unarranged collections and duplicates are disposed geographically, and are in progress of incorporation with the arranged herbarium, either as furnishing distinct species, or as completing the specimens of those already contained in a less perfect state. The additional species in these collections probably amount to nearly 5000 phanerogamous plants."

In the following year certain other collections, until then in the charge of the principal librarian, were transferred to the Banksian Department. These, according to the following account submitted by Brown, comprised:—

"1. Sir Hans Sloane's herbarium, formed by himself and other botanists, whose collections are kept distinct from each other in about 333 volumes, all of them in a tolerably good state of preservation; they are all numbered on the backs, and may be referred to without difficulty. 2. Baron de Moll's herbarium, purchased by the Trustees, together with his library, in 1816. 3. A collection of Chelsea Garden Plants. Sir Hans Sloane in 1721 gave the freehold of the ground to the Company of Apothecaries on condition that 50 new plants should annually be delivered to the Royal Society till the total amounted to 2000 distinct species. The list of the 50 first [appeared] in the *Philosophical Transactions* for 1722, and that which completed the required nnmber, 2000, in 1761. It appears, however, that the Company remained tributary in 50 distinct species per annum till the year 1796, at which time the number of 3750 was completed in 75 large fasciculi, which are now extant in perfect preservation. Besides these herbaria, there is also a collection of fruits and seeds in spirits of wine, and another of dried specimens of fruits and seeds, roots, wood, and other parts of vegetables."

Of Sir Hans Sloane's important collection, some account follows. The Chelsea Garden plants are now incorporated with the general herbarium. The Baron de Moll's collection, according to the report of König and Baber, who went to examine his minerals before their purchase by the Trustees, contained specimens from Pallas and other eminent botanists, as well as plants collected by himself in the Alps; this was probably incorporated with the general herbarium, but no specimens can now be identified as coming therefrom.

The Sloane Herbarium.

This extensive herbarium, containing as it does the results of some of the earliest botanical investigations of China, India, and the New World, is of the greatest historical value. The plants are

catalogued in two copies of Ray's *Historia Plantarum* preserved in the Department, so that they can be easily consulted.

The plants collected by Sloane himself in Jamaica occupy eight volumes, in which are included the drawings from which the plates in the *Natural History of Jamaica* were made; Sloane's own copy of this work, with his MS. notes, accompanies the collection. Among the principal contents of the herbarium may be mentioned: the plants collected by James Cunningham in China, in 1698–1703; those from the Philippines, by Kamel, sent to Petiver in 1701, and described in the Appendix to Ray's *Historia Plantarum*, vol. iii.; the collections of Petiver and Plukenet, containing a large number of the plants figured and described in their works; American plants from Banister, Bartram, Catesby, Houstoun, Krieg, and Vernon; the collections of Hermann and Oldenland, from the Cape of Good Hope; Kaempfer's plants from Japan (1691); plants from Jussieu, Tournefort, and Vaillant; and those of most of the contemporary English botanists—Buddle (an important British herbarium), Doody, Philip Miller, Merrett, Ray, Sherard, Uvedale; and from the gardens of Badminton, Oxford, and Westminster.

The Banksian Herbarium.

The herbarium of Sir Joseph Banks (1743–1820) is the foundation of the General Herbarium. At the time of its acquisition it was one of the most important in existence—not only on account of its extent, but as containing a large number of types of published species—and, owing to the freedom of access which was allowed to it, one of the most frequently cited in botanical works. Besides the invaluable collections made in Malaya, Brazil, South Africa, Polynesia, Australia, and New Zealand, by Banks and Solander, in their voyage round the world with Cook in 1768–71, it contains the plants collected by Banks in Great Britain at various dates, and in Newfoundland and Labrador in 1766, as well as those obtained in Iceland in 1772. The herbarium was continually being enriched by purchase and exchange. Besides Hermann's herbarium, and the herbarium of Clifford upon which the *Hortus Cliffortianus* is based, a certain number of Linnæus's types were obtained from Smith in 1786, when the Banksian herbarium was compared with that of Linnæus. The collections of William Houstoun from Central America and the West Indies were purchased by Banks from Philip Miller, whose own herbarium, containing the types of many of the plants described in the *Gardeners Dictionary*, ed. viii. (1768), was acquired by Banks in 1774. In that year Banks arranged with the "Societas Unitatis Fratrum," or Moravian Brothers, to collect plants at Tranquebar, whence he received about 500 specimens in 1775–78. In 1775 he purchased a large herbarium of Swiss plants, indicated in the herbarium as "Herb. Helvet.," collected by Dick; these Banks obtained through Dr. Pitcairn (1711–91), who had a botanic garden at Islington, specimens from which are in the herbarium. The collections of the Forsters and of Loureiro were acquired at about the same time. The plants collected by Alexander Russell (1715?–68) and his brother Patrick (1726–1805), who were

at Aleppo in 1740–53 and 1755–71 respectively, were sent to Banks, and are described by him and Solander in the *Natural History of Aleppo*, ed. 2 (1789). Other well-known London gardens contributed to the Banksian collection at this period: notably those of James Gordon at Mile End, James Lee at Hammersmith, William Malcolm at Kensington, and James Vere at Kensington Gore; there are also a few specimens from the garden of Richard Anthony Salisbury at Chapel Allerton, Yorkshire. The most important collection of cultivated plants is, however, that from the Royal Gardens, Kew, which contains the types of the numerous species described by Banks's librarians Solander and Dryander (helped in the second edition by Brown) in Aiton's *Hortus Kewensis*; the MS. original descriptions of these and of a large number of other plants in the Sloane and Banksian herbaria are preserved in the Department of Botany. Jacquin's herbarium, consisting largely of plants cultivated by him in the Vienna and Schönbrunn Gardens and containing some of his West Indian plants, was purchased by Banks and is incorporated with his collection, which also contains specimens sent by A. L. de Jussieu from the Paris Garden.

Among the more noteworthy of the Indian collectors are William Roxburgh; Buchanan (Hamilton) (who sent plants to Banks in 1794 and 1798); J. G. Koenig, who sent plants in 1776, and bequeathed to Banks his herbarium and MSS.; James Robertson, who collected in Bombay, Madras, China, and Johanna Island in 1772–76. The most important Chinese collection is that made by Sir George Staunton during Lord Macartney's embassy to China in 1793.

From Polynesia are the large collections of J. R. and G. Forster, made during Cook's second voyage (1772–75); also plants obtained during Cook's third voyage (1776–80) by David Nelson, who also collected in Australia and Timor; William Anderson also collected during these voyages in the same countries. The specimens collected by Christopher Smith and James Wiles during Bligh's voyage to Otaheite (1791–93) were also sent to Banks.

From the Cape there are, besides the very important collections of Francis Masson (1741–1805), who also sent plants to Banks from the Canaries and Azores, from the West Indies, and from North America and Canada; about 1000 specimens from Oldenburg, collected in 1772; and others from James Niven (1774 ?–1826), David Nelson (*d.* 1789), and Andreas Auge (*fl.* 1794). Among the collectors in tropical Africa may be mentioned William Brass (*fl.* 1790), who collected at Cape Coast; Henry Smeathman (*fl.* 1750–87), who sent plants from Madagascar and Sierra Leone; and Christian Smith (1785–1816), whose important collections during the Congo expedition were described by Robert Brown. The principal contributor of Madagascar plants was John Vaughan Thompson (*fl.* 1807–29).

Among New World collections, the most important is that of John Clayton (1686 ?–1773), who sent his Virginian plants to Gronovius; they are the types of Gronovius's *Flora Virginica* (1743–1762). The volume of South Carolina plants collected by William Young (*fl.* 1753–84), with an accompanying volume of crude drawings, was acquired by Banks from the Bute library in 1794. Other early

American collectors represented in the herbarium are John Bartram (1699–1777), and his son William (1739–1823); W. V. Turner, who collected in the "Cherokee Country" in 1769; Peter Kalm (1717–79); William Clifton (*fl.* 1765); Dr. John Mitchell (*d.* 1772); and Archibald Menzies (1754–1842).

Among West Indian collectors may be mentioned Olof Swartz (1760–1818), who contributed largely to the herbarium and worked at the material therein preserved, obtained by previous collectors; the results of his researches are included in his *Prodromus* (1783), where he pays a high tribute to Banks—"Non poterunt immortales perillustris hujus viri digne satis celebrari laudes"; Henri de Ponthieu sent plants from the Caribee Islands in 1778; William Wright (1735–1819) and Roger Shakespear from Jamaica, the latter collected in 1777–82; Alexander Anderson (*d.* 1815), plants from Demerara in 1791 and later from the St. Vincent Garden, of which he was curator; John Greg, plants from Dominica, collected 1777.

Robert Brown's Herbarium.

At the death of Robert Brown in 1858, his herbarium came into the possession of John Joseph Bennett, then Keeper of the Department of Botany. It mainly consisted of the very valuable and interesting collection made by him in his capacity as naturalist during the voyage of H.M.S. *Investigator*, commanded by Captain Flinders, on the coast of New Holland and Van Diemen's Land in 1802–5, and included nearly 3900 species, among them being the types of Brown's *Prodromus Floræ Novæ Hollandiæ*. The herbarium during Bennett's lifetime was kept at the Museum, and was accessible to botanists; it was largely employed by Bentham in the preparation of his *Flora Australiensis*. On Bennett's death, in 1876, the Museum became possessed of a complete and very fine series of the Australian plants, with all Brown's notes, and of the remainder of his herbarium, which contained Australian plants from Baxter, Sturt, Mitchell, and Labillardière, Brown's own collections in Timor and at the Cape, and various specimens from other collectors, including types of species described by Brown.

HEPATICS OF CAITHNESS.

By the Rev. D. Lillie, B.D.

The following list of Caithness hepatics is the result of my work in these plants for the past few years. So far as I know, the hepatics of Caithness have not previously been worked out, at least to any extent, by any other observer. All the plants here recorded have been gathered by myself, in some cases with the help of my brother, Mr. George Lillie, Swiney, Lybster. Specimens of all the species have been seen by Mr. Macvicar, without whose kind aid in identifying and verifying species, the list could have no claim to completeness or accuracy.

For the purpose of the study of hepatics and mosses, Caithness

may in a rough way be divided into the three following pretty distinct districts :—

(I) The hilly district to the south and south-west, extending along the Sutherlandshire boundary. The district embraces the Ord of Caithness, so far as included in Caithness—on the east, the Scaraben Hills (2054 ft.), Maiden Nap (1587 ft.), Morven (2313 ft.); and in the extreme west Ben Rha (795 ft.). These hills exhibit a considerable variety of rock structure with corresponding differences in the hepatic- and moss-flora, the quartzites of the Scarabens being very poor in these plants ; while the conglomerates and sandstones of Morven and Maiden Nap are rich and varied.

(II) A district embracing the greater part of the area of the county; for the most part very level, but here and there rising into low hills, of which, from a botanical point of view, the Dorrery Hills are the most interesting. In this district, the locality I have found most rich and varied in hepatics and mosses, especially the calcicolous kinds, is the ravine of Reisgill Burn, near Lybster. Of this district perhaps probably upwards of two-thirds are peat moors, the rest being mostly arable and pasture lands.

(III) The third district, by far the smallest, but also the most distinct, includes the sandy links along the seashore at Sandside Bay, and Dunnet Bay on the west and north, and at Sinclair's Bay on the east. This district is indeed rather poor in hepatics but has an extremely interesting moss-flora, which contains such plants as *Swartzia inclinata* (Ehrh.), plentifully; *Eucalypta rhabdocarpa* (Schwaeg.); *Trichostomum fragile* Dixon, in places abundant; *Meesia trichodes* Spr.; *Amblyodon dealbatus* P. B.

I indicate by Roman numerals the occurrence of the plants as I have found them in these three districts. I give names of localities where I have found the respective species in only one or two places. These and the other indications of relative frequency can only be regarded as indicating in a general way the occurrence of the species as they have been collected by me.

In the case of some, especially of the rarer species, I have noted the occurrence of fruiting specimens, but my record of these can hardly be regarded as complete.

The nomenclature and arrangement are mainly those of Pearson's *Hepaticæ of the British Isles*.

Frullania tamarisci Dum. Common (I, II, III).—*F. fragilifolia* Tayl. Ben Rha (I). — *F. dilatata* Dum. Not unfrequent where there are trees affording a suitable habitat; but trees are not abundant in Caithness (I, II), frt.

Lejeunea serpyllifolia Lib. Frequent (I, II). — *L. patens* Lindb. Benacheilt (I).—*L. calcarea* Lib. Dorrery Hills (II).

Radula Lindbergii Gottsche. Dunbeath Strath, but probably overlooked elsewhere (II).—*R. complanata* Dum. Common (I, II).

Porella rivularis Lindb. Dirlot, Dorrery (II).

Pleurozia cochleariformis Dum. Frequent (I, II).

Anthelia Juratzkana Spruce. Morven (I), frt.

Blepharozia ciliaris Dum. Gobernuisgach, Scaraben (I).

Trichocolea tomentella Dum. Scorrieclett (II).
Blepharostoma trichophyllum Dum. Not unfrequent (I, II), frt.
Chandonanthus setiformis Mitt. Morven (I).
Lepidozia reptans Dum. Frequent (I, II).—*L. Pearsoni* Spruce. Morven, Scaraben (I). — *L. setacea* Mitt. Common (I, II). — *L. trichoclados* C. Müll. Not unfrequent (I, II), frt.
Bazzania triangularis Lindb. Morven (I).
Kantia trichomanis Gr. & B. Common (I, II). — *K. Sprengelii* Pearson. Frequent (I, II).
Cephalozia bicuspidata Dum. Common (I, II, III).—*C. lunulæfolia* Dum. Not unfrequent (I, II). — *C. Lammersiana* Spruce. Not common (I, II).—*C. connivens* Spruce. Frequent (I, II).—*C. fluitans* Spruce. Not unfrequent (I, II), frt.—*C. Sphagni* Spruce. Common (I, II).—*C. denudata* Spruce. Not unfrequent (I, II).—*J. Floerkei* W. & M. Frequent, and exhibiting considerable variety *C. divaricata* Dum. Frequent (I, II, III), frt. — *C. stellulifera* Pearson. Badryrie (II), frt. — *C. leucantha* Spruce. Frequent (I, II), frt.
Scapania compacta Dum. Dunbeath Strath (I). — *S. subalpina* Dum. Langwell Deer Forest (I).—*S. aspera* Müller & Bernet (?). Reisgill Burn, and abundantly on links by the seashore (II, III).—*S. resupinata* Dum. Frequent (I, II).—*S. undulata* Dum. Common (I, II, III).—*S. purpurascens* Pearson. Frequent in hilly districts (I, II).—*S. irrigua* Dum. Not unfrequent (I, II).—*S. rosacea* Dum. Morven (I).—*S. curta* Dum. Apparently not common (II).
Diplophyllum albicans Dum. Common (I, II, III).—*D. Dicksoni* Dum. Morven (I), frt.
Lophocolea bidentata Dum. Common (I, II, III), frt.—*L. cuspidata* Limpr. Not unfrequent (I, II), frt.
Chilocyphus polyanthos Dum. Frequent (I, II, III).
Harpanthus Flotowii Nees. Ousdale (I).
Mylia Taylori Gr. & B. Frequent (I, II).—*M. anomala* Gr. & B. Frequent (I, II).
Plagiochila asplenioides Dum. Frequent (I, II).—*P. spinulosa* Dum. Langwell (I).
Jungermannia pumila With. Somewhat rare (I, II), frt. — *J. riparia* Tayl. Frequent (I, II, III), frt.—*J. sphærocarpa* Hook. Caunster (II).—*J. crenulata* Smith. Frequent (II).—Var. *gracillima* Sm. Frequent (II).—*J. inflata* Huds. Common (I, II), frt.—*J. turbinata* Raddi. Frequent in calcareous habitats (I, II, III), frt. —*J. bantriensis* Hook. Not frequent (II). — Var. *Müllerі* Nees. More frequent (I, II). — *J. Kaurini* Limpr. Ousdale (the only record, so far as I know, from the British Isles) (I), frt.—*J. capitata* Hook. Rare (II, III), frt.—*J. bicrenata* Schmid. Badlipster (II), frt.—*J. ventricosa* Wicks. Common (I, II).—*J. gelida* Tayl. Morven (I).—*J. incisa* Schrad. Frequent (I, II).—*J. exsectæformis* Breidl. Not unfrequent (I, II).—*J. Lyoni* Tayl. Not common (I, II), frt.—*J. gracilis* Schleich. Not common (I).—*J. atlantica* Kaal. Wirlot (the only record, so far as I know, from the British Isles) (II).—of forms (I, II, III).—Var. *Baueriana* Schiffn. Not unfrequent on hills (I, II).—Var. *Naumanniana* Nees. Newlands of Clyth (II).—

J. minuta Crantz. Not unfrequent (I, II). — *J. orcadensis* Hook. Abundant on Morven and neighbouring hills (I).

Nardia (*Eucalyx*) *hyalina* Lindb. Not unfrequent (I, II).— *N.* (*E.*) *obovata* Lindb. Not unfrequent (I, II). — *N.* (*E.*) *scalaris* Gr. & B. Common (I, II, III).

Marsupella emarginata Dum. Frequent (I, II). — *M. aquatica* Lindenb. Not frequent (I).

Cesia coralloides Carruth. Morven (I).—*C. concinnata* Gr. & B. Morven (I). — *C. obtusa* Lindb. Morven, abundant (I), frt. — *C. crenulata* Pearson. Morven (I).

Fossombronia pusilla Dum. Watten, apparently not frequent (II).—*F. cristata* Lindb. More frequent (II).

Blasia pusilla L. Frequent (I, II).

Pellia epiphylla Lindb. Common (I, II, III). — *P. Neesiana* Limpr. Not unfrequent (I, II).—*P. calycina* Pearson. Frequent (II).

Aneura palmata Dum. Badlipster (II). — *A. multifida* Dum. Common (I, II, III).—*A. latifrons* Lindb. Not uncommon (I, II).— *A. pinguis* Dum. Common (I, II, III).

Metzgeria pubescens Raddi. Reisgill Burn (II).—*M. furcata* Dum. Frequent (I, II).—*M. conjugata* Lindb. Dunbeath Strath (I).

Marchantia polymorpha L. Not common (I, II, III).

Conocephalus conicus Dum. Frequent (I, II).

Reboulia hemispherica Raddi. Dorrery Hills (II).

Preissia commutata Nees. Not frequent (II).

Lunularia cruciata Dum. Garden, Watten Manse; probably an import (II).

Anthoceros lævis L. Swiney (II), frt.—*A. punctatus* L. Somewhat rare (I, II), frt.

SILENE DUBIA Herbich IN BRITAIN.

By C. E. Salmon, F.L.S.

This name appears in Herbich's *Flora der Bucovina*, 388 (1859) as a species, with the description:—"Caule erecto paniculato superne pedunculis calycibusque glanduloso-pilosis, foliis radicalibus confertis spathulato-lanceolatis utrinque et margine scabris, floribus erectis, laciniis laminæ bifidæ linearibus. . . . Radix longa ramosa flavescens. Caulis erectus pedalis et ultra. Folia radicalia in petiolum longum attenuata acutiuscula vel mucronulata, margine setulis brevissimis scabra. Flores flavescentes. Calyx tubulosus subcylindricus, dentibus acutis, ciliatis, fructiferus ampliatus et subclavatus. Capsula ovata carpophoro quadruplo longior." This description may be contrasted with his diagnosis of *S. nutans* L.: "Floribus paniculatis secundis cernuis, petalis bipartitis laciniis linearibus, foliis lanceolatis pubescentibus."

Nyman (Conspect. Fl. Europ. 90) places *S. dubia* under the subspecies *transsilranica* Schur of *S. nutans*, with distribution, "Transs. Bucov. &c." Mr. Williams (Journ. Linn. Soc. (Bot.) xxxii. 171 (1896)), further reduces it as *S. nutans* L. var. γ *dubia*, with this

description :—" Pili breviores recurvi nec stricti. Flores minores, petalis viridi-luteis. Capsula carpophorum quinquies superans. Geogr. area.—N. and E. Arctic Siberia, S. and W. Canary Isles." Richter (Plantæ Europ. 316 (1899)) follows Mr. Williams, and mentions that it occurs in " Gall. Galic. Transsilv. Roman."

Having been much puzzled with a *Silene* which Mr. T. Hilton sent me in 1896 and following years from the downs near Brighton, E. Sussex, I made a visit to the locality with him in June last, and examined the plant in a fresh state. It appeared distinct at a glance from *S. nutans* L., and yet did not come under *S. italica* Pers., as it had been named for me by more than one British botanist.

On looking through the examples of *Silene* in the National Herbarium, and reading descriptions of the species allied to *S. nutans* and *italica*, I came to the conclusion that our Sussex plant could be no other than *S. dubia*, a plant extremely likely, from its distribution, to occur in Great Britain. Indeed, on looking through the Silenes in the British Herbarium in a rather hurried manner owing to limited time, it was easy to see that a plant labelled " *S. nutans* L. Exposed limestone rocks, Millersdale, N.W. Derbyshire. June, 1882. C. Bailey," was also *S. dubia*. To this also must be referred, I think, the plants from Don's Bridge, Jersey, 1897 (D. T. Playfair); Kincardine, 1843 (W. Gardiner); Dungeness, Kent, 1888 (E. S. & C. E. S.) (see Report Wats. Bot. Club, 1900, 26, and 1901, 8).

There is no doubt that true *S. italica* Pers. occurs in Kent, but a specimen I possess so named and localized, " Orig. Hythe, leg. F. Dickinson," certainly seems to me, with its crowned petals, &c., to be better placed under *S. dubia*.

Whether *S. dubia* is retained as a species, subspecies, or variety, is a matter of taste and temperament; it contrasts with its near allies in the following points. From *S. italica* Pers. it differs in having its petals crowned, not auricled and not ciliate, its calyx not so narrowly elongated at its base and teeth acute, and its carpophore not nearly as long as capsule: from *S. paradoxa* L. by its not elongated " *italica*-like" calyx and shorter carpophore: and, finally, it may be separated from *S. nutans* L. by its habit, which is much more delicate and graceful; by it being much less hairy and viscid in all its parts; by its root-leaves being long-petioled, spathulate-acute, with many almost glabrous leaves, except for scabrid margins; by its narrow, lanceolate-acute stem-leaves; and by its calyx being narrower and more cylindrical.

The hairs on the lower half of the stem are shorter and more regularly recurved in *S. dubia* than in *S. nutans*; this is, no doubt, to what Mr. Williams refers (*l. c.*), but it is unfortunate he did not give a short description of the latter plant for the sake of comparison.

Herbich's description of relative lengths of capsule and carpophore seems to fit the plants of *S. dubia* that I have seen more happily than Mr. Williams's amended version.

SHORT NOTES.

Rhipidosiphon.—Mr. K. Yendo, having seen our paper (Journ. Bot. 1904, 363), has written as follows:—"I have collected the alga in Japan several years ago. I thought it referable to Montagne's species, but as I had some doubt (especially on the anastomosing character), I sent some of the specimen to Prof. N. Wille. He wrote to me that the plant I sent is unmistakeably Montagne's species, which he never saw before. I think I am the man next to Montagne who collected the alga. It was collected in July, 1900, in the province Hiuga, Japan." This is an interesting addition to the distribution of the plant, extending it to extra-tropical waters. The type was found by Hombron in Java about 1840; Ferguson afterwards gathered it in Ceylon; then Mme. Weber in the Malay Archipelago in 1885 and 1900; and K. Yendo in Japan in the latter year. The genus having proved to be badly founded, the name of the plant is now *Udotea javensis*.—A. & E. S. Gepp.

Galeopsis Ladanum L.—Under this name two new county records are given in the March number of this Journal, *viz.* for Glamorgan (p. 93) and for West Lancashire (p. 95). What plant is meant by this specific name? The *Student's Flora* (ed. 3) divides *G. Ladanum* L. into subspecies, "*G. Ladanum* proper (*L. Herb.*)" with *G. intermedia* Vill. as a synonym, and *G. angustifolia* Ehrh. with synonym of *G. canescens* Schultz. Two counties only, Moray and Denbigh, are given for the former; the latter is the prevailing form. The *Manual of British Botany* (ed. 9) arranges the species thus:—*G. Ladanum* L. = *G. angustifolia* Ehrh.; *β G. intermedia* (Vill.); *γ G. canescens* (Schultz). Only Moray is mentioned for *β*, though two other localities in Dorset and Derbyshire were recorded in Journ. Bot. 1895, pp. 155, 186. At p. 155 I pointed out that in the *London Catalogue* (eds. 8 and 9), *G. Ladanum* L. stands for the rare species *G. intermedia* Vill., while *G. angustifolia* Ehrh., numbered as a distinct species, represents the common form. This variation in the meaning of *G. Ladanum* L. should be borne in mind, and those using the name would do well to add an explanatory synonym or note.—E. F. Linton.

Fumaria parviflora Lam.—I was much surprised by finding (in company with Mrs. Gregory) on Sept. 23rd, 1904, a considerable quantity of this plant in arable land close to Badbury Rings, Dorset. It was, in fact, almost as plentiful as *F. officinalis*. *F. densiflora* also occurred in small quantity. A large amount of land was under cultivation, and so far as I was able to examine it, *F. parviflora* was almost the prevalent species. This is, I believe, the first authentic notice of its occurrence in Dorset. Mr. Moyle Rogers tells me that he has seen the specimens which did duty for Dorset "*parviflora*" in the first edition of *Topographical Botany*, and that they are not the true plant.—R. P. Murray.

Zygodon Forsteri in Worcestershire.—I have recently had sent to me a very interesting addition to the Worcestershire moss-flora, the rare *Zygodon Forsteri* Mitt., only recorded from Epping

Forest, Sussex, and Somerset. This was found by Mr. H. H. Knight, of Llandovery, during the Christmas holidays, on trees near Harvington, Worcestershire,—J. E. Bagnall.

NOTICES OF BOOKS.

An Account of the British Hieracia. By Rev. W. R. Linton. Pp. 96, demy 8vo, wrapper. West, Newman & Co., Hatton Garden, E.C. January, 1905. Price 4s.

Of the making of hawkweeds there is no end. In the eighth edition of the *London Catalogue* there were 40 species and 18 varieties. In the ninth edition (1895) the list extended to 104 species, 114 varieties, 2 hybrids, and 1 form. In Mr. W. R. Linton's *Account* there are 124 species, 130 varieties, 5 forms, and 1 subspecies—making a grand total of 260 names. In the index to the same, the specific and varietal names are in a single series in roman type, without distinguishing mark; the names in italic type are either non-British species referred to, or else synonyms (reference to the page cited is necessary to decide).

Mr. Linton has long made a careful study of the British forms of *Hieracium*, both in the wild state and under cultivation in the more genial soil of a vicarage garden. In the well-known set issued by Messrs. Linton, both wild and cultivated examples are distributed in the consecutive numbers running through the fasciculi. Critical students are thus enabled to note the actual differences in the particular plant under cultivation as compared with its facies in the wild state. In some instances, of which No. 94, *H. dissimile*, is a case in point, the differences are so patent, that, according to Fries's group-characters, the cultivated specimen would belong to another section altogether. In his unfinished *Monograph*, Mr. F. J. Hanbury notes the same tendency to marked variation among members of the *Alpina* section when transferred from the granite and mica of the Scottish Highlands to the looser soil of a London garden. That such variation is likely to affect plants so transferred is implied also in the author's Introduction, where, in speaking of climatic conditions, he says:—"Hieracia are found mostly on hills, rocks, especially on mountains, only very few forms occurring on the plains. The inference is that it is the climatic conditions of these regions (montane and alpine) which are especially favourable to the genesis of new forms. The nature of the high alpine forms (short stature, large, single, or few heads), the nature also of the montane forms, and the habit tall and leafy of those which grow by stream-sides,—all favour the same idea that the different species are due to varying climatic conditions." This brings one to the gist of the argument as to what really constitutes the basis of the essential characters which are alleged themselves to constitute specific differences, and in a subsidiary degree varietal differences, in a protean type like *Hieracium*. Nägeli long ago

demonstrated that the crossing of nearly-related "species" of *Hieracium* does not, as might *à priori* be expected, lead to the production of intermediate forms, but rather of varieties which possess the characteristics of the one or the other parent-forms intensified—a result which harmonizes completely with the process described by Eimer as one-sided heredity.

In order rightly to study the hawkweeds of a definite area, it is incumbent on the critical botanist undertaking the difficult task that he should acquaint himself with those phenomena of phylogeny and heredity which specially bear on this remarkable genus; otherwise he will attach too much importance to trivial differences which are devoid of evolutional significance. Several continental workers have already studied the genus *Hieracium* in the light of such phenomena, and their investigations have been rewarded with success. Eimer's theory of Genepistasis has been applied by both Focke and Abbot Mendel, of Brünn, and later by Tschermak. Quite recently the whole aspect of the question has been modified by the investigations of Prof. Ostenfeld, showing the frequency of parthenogenesis in *Hieracium*—that last shift of an unstable type to maintain, at any rate, some reputable degree of constancy, even if only for one generation.

It would have been interesting had Mr. Linton given some of his reasons for splitting up the British members of *Hieracium* into so many species and varieties, as the case is not at all parallel to that of *Alchemilla* as studied by German and Swiss botanists, where the characters which obtain for the separation of species are of quite another category. Further, in the case of a group of plants so susceptible to the conditions of environment and of climatic variation, the important phenomena outlined in De Vries's *Mutation of Species* have a special significance, as further evidenced in *Rubus*. We understand that an observant batologist has noticed that a single bramble-bush may change its "specific" characters within a comparatively short period; how much more is it likely that a hawkweed under variable conditions may vary indefinitely within specific limits, and how desirable it is that such specific limits should be considerably enlarged. A series of carefully compiled descriptions, based on ample material, such as Mr. Linton has given, supply the pabulum for unrestricted speculation as to the comparative value of trifling differences in the process of realizing a definite type, when certain characters tend to disappear, and others, adjusted to the environment, remain dominant. This factor in the process of organic evolution is emphasized in a lucid sentence in the author's Introduction :—"Under the influence of changes in external conditions, the innate tendency to variation becomes active."

In raising a variety to specific rank (as is frequently done in this revision), and in transferring a variety from one species to another, the name of the original authority in the new combination should be changed, otherwise it transgresses the salutary Candollean rule in that it makes an author say what he has not said. There seems rather a tendency throughout to take unchallenged the opinions of certain Scandinavian botanists on dried specimens sent

to them for identification, instead of at once making a definite and critical examination of the living plants met with in the course of field work. On p. 81, *H. rigidum* of Hartman is described; this plant is, however, so obscurely and vaguely characterized by Hartman (1820), that most critical students of the genus have preferred to quote Fries (1862) as the authority, as the plant he describes under this name is clearly indicated, and its identity does not admit of doubt.

The book is well printed on stout paper, and the text is free from typographical errors.

FREDERIC N. WILLIAMS.

[The citation of Fries as the authority for *H. rigidum* introduces a principle which would, we think, be fatal to anything like stability in nomenclature.—ED. JOURN. BOT.]

Biochemie der Pflanzen. Von FRIEDRICH CZAPEK, Professor der Botanik in Prag. Bd. I. 8vo, pp. xv, 584. Jena: Fischer. 1905. Price 14 M.

DR. CZAPEK'S book gives a detailed account of the chemistry of the various great groups of substances which we associate with the building-up processes in plants. It is divided into three parts. The first, an historical introduction of twenty pages, sketches the course of evolution of the study of plant-nutrition. The second, or general part, comprising about seventy pages, includes two chapters. The first, entitled "The Substratum of the Chemical Processes in the Living Organism," discusses the composition and properties of protoplasm, and the various theories which have been advanced as to its structure; while the second, "The Chemical Reactions in Living Plant-organisms," treats of the chemical and physical properties of the cell, catalysis, enzymes, their nature, formation, relation to external factors, &c. In the second, or special portion, occupying the rest of the volume, the author gives a detailed treatment of the various substances formed in the process of assimilation,—fats, sugars, and carbo-hydrates in general, discussing their formation in different plant-groups and organs, their storage as reserves, and subsequent use &c. A chapter is also devoted to CO_2 assimilation and synthesis of sugar by the chlorophyll corpuscle (with a reference to chlorophyll-assimilation in animals), the structure and chemistry of the corpuscle and its pigment are somewhat exhaustively treated, and reference is made to the various other pigments which are associated with photo-synthesis, especially in the Algæ. The last chapter deals with the cell-membrane in bacteria, fungi, algæ, mosses, ferns, and seed-plants, and the changes it undergoes, both structural and chemical—such, for instance, as are associated with formation of pectoses, gums, cork, cutin, wood, &c.

The volume represents a vast amount of research, and teems with references to original papers, which are placed at the bottom of each page, and occupy sometimes as much as one-fourth to one-third of the space. It should prove a useful work of reference to those interested in this phase of plant-physiology.

A. B. R.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on Feb. 16, a paper was read by Mr. John Gilbert Baker entitled "A Revised Classification of Roses." He dealt with the genus by dividing it into three groups. In the first group primary species were enumerated; in the second, subspecies and varieties; in the third, the principal hybrids. The primary species as estimated by the author are sixty-nine in number, and they are classified under eleven groups, which may be briefly diagnosed as follows:—(i) *Simplicifoliæ*, with simple, exstipulate leaves; (ii) *Systylæ*, with styles protruded beyond the disc as a united column; (iii) *Banksianæ*, with free, deciduous, linear stipules; (iv) *Bracteatæ*, with adnate stipules, hairy fruits, and prickles in infra-stipular pairs; (v) *Microphyllæ*, like the last, but the fruit glabrous, with a thick green pericarp; (vi) *Cinnamomeæ*, like the last, but the fruits red and glabrous, with a thin pericarp; (vii) *Spinosissimæ*, prickles very unequal, never in stipular pairs; (viii) *Gallicanæ*, like the last, but prickles slightly unequal, with leaflets coriaceous and rugose; (ix) *Caninæ*, prickles equal, not in stipular pairs, leaves glabrous or slightly pubescent; (x) *Villosæ*, like the last, but leaves very hairy; (xi) *Rubiginosæ*, like the last, but leaves very glandular beneath. The geographical distribution can be very briefly stated as follows:—Five species are found south of the Tropic of Cancer in elevated situations, two in Abyssinia, one in the Neilgherries, and two in Mexico. There are six geographical regions in the North Temperate zone, each with a considerable proportion of endemic species:—(1) Europe, with 29 species; (2) Northern Asia with China and Japan, 26 species; (3) Western Asia, with 18 species; (4) India, with 9 species; (5) Western North America with the Rocky Mountains, with 10 species; (6) Eastern North America, 6 species.

At the same meeting was read a paper on the plants collected by Dr. A. G. Bagshawe on the Anglo-German Uganda Boundary Commission, by Mr. E. G. Baker (*Polypetalæ*), Mr. Spencer Moore (*Gamopetalæ*), and Dr. Rendle (*Convolvulaceæ*, *Apetalæ*, and Monocotyledons). The Commission began to demarcate the Boundary in the Uganda Protectorate in December, 1902, H.M. Commissioner on the British side being Lieut.-Col. Delmé-Radcliffe. Beginning at the mouth of the Kagera river, at the point where the river empties itself into the Victoria Nyanza, a standing camp was made for three months. The second collecting centre was Mulema, in South Ankole, lat. 1° S., long. 31° E., about sixty miles from the lake; then Barumba, where a few plants were collected fifteen miles further west. The next centre was the district of the high hills of Ruchigga, at an altitude of from 5500–7800 ft. Two visits were paid to an isolated hill, Irunga, alt. 7160 ft., which lies at the intersection of the British, German, and Congo boundaries; a visit was paid to the river Rufúa, which drains Lake Karenge. The last important collecting-centre was the island of Buvuma, opposite the exit of the Nile from the Victoria Nyanza. The collection contains a considerable number (some fifty) of novelties, as also of known plants not hitherto recorded from the Uganda Protectorate. For the Angolan plant

previously known as *Asystasia africana* C. B. Clarke, which also is in the collection, a new genus—*Styasasia*—is proposed. A considerable percentage of West African coast-plants is a feature of the Protectorate Flora as now made known, and the presence of a small South African element is worthy of mention.

At the meeting of the Linnean Society on March 16th, Dr. Otto Stapf presented a paper entitled "Contributions to the Flora of Liberia," being descriptions of 3 new genera and 56 new species in a collection of about 260 species made by Mr. Alexander Whyte in the neighbourhood of Monrovia, in three different localities. The flora shows a specific likeness to that of Sierra Leone, and the new genera are not endemic:—*Atroxima* (Polygalaceæ), with 3 species; *Urobotrya* (Olacaceæ), with 3 species; and *Afrodaphne* (Lauraceæ), with 17 species, 2 being new to science, the others transferred from *Beilschmiedia* and *Cryptocarya*.

In the *Proceedings of the Manchester Field Club* (vol. i. part 2, 1900–01, issued Jan. 23, 1905) is a portrait of David Dyson, an Oldham mill-worker, who was born at Oldham in April, 1823, and died at Rusholme, Manchester, Dec. 10, 1856. The portrait is accompanied by "some reminiscences of his career," contributed by Mrs. Ives, of Stockport, in the course of which we are told that "in some way not known the authorities of the British Museum became aware of his skill as a field botanist, and offered him an appointment as plant collector in Honduras and Central America; his stay in these regions extended over four years, during which he sent many hundreds of dried plants." Dyson's name is entirely unknown at the Museum; it seemed desirable to make further inquiries, which we were able to do through the kindness of Mr. Charles Bailey, who communicated with Mrs. Ives. In a long letter, which we have seen, Mrs. Ives gives further particulars of Dyson, from whom she received all the above information, with the added remark that, "in speaking of the British Museum people, he said they were a set of prejudiced and dried-up old fogies." We fear this opinion will be confirmed, for those who accept Dyson's statement, by our inability to regard it as having any foundation in fact. Dyson "to the day of his death did not know how to read or to write: when the authorities of the British Museum asked him by what method he distinguished natural history objects from each other, he told them that he had a mode of writing of his own, a kind of hieroglyphic marking understood only by himself," and therefore, one would think, unsuitable for correspondence. Nevertheless he published in 1850 a little book on "The Land and Fresh-water Shells of the districts around Manchester." Dyson was no doubt a remarkable man, but he certainly was not employed as a plant-collector by the British Museum, and he is equally unknown to the authorities at Kew.

Messrs. Macmillan & Co. send us the third edition (price 6s.) of *The Book of the Rose*, by the Rev. A. Foster-Melliar. The book should prove of the greatest use to all those who love to grow roses. The letterpress is improved by the addition of forty-one photographs and sketches showing the most characteristic roses of the different

groups. By a curious slip on the part of the printer the rose shown facing p. 22 is called "Blush Rambler"—a quite different variety belonging to the Polyantha section. The chapters on soils, situation, planting, pruning, exhibiting, propagation, pests, &c., are admirable, and ought to be of the greatest value to all rose-growers, both amateur and professional. The chapter on "Manners and Customs," which occupies more than 100 pages out of the whole 356, is interesting, inasmuch as it gives the author's personal experiences with many kinds of roses—whether they bloom freely or otherwise, are subject to mildew-attacks, and so forth. The least satisfactory feature about this section of an otherwise excellent treatise is the fact that, although the peculiarities—or "manners and customs"—of all the best roses are detailed, the descriptions in many cases fail to record the *colour* of the varieties described. For example, "Her Majesty" absorbs over two pages of matter, and yet the nearest we get to its colour is that "the colour is best and purest in the first of these stages." Of course, experts know the colour of most of the roses mentioned without the aid of a description, but it can be hardly expected that the beginner should possess the same knowledge until he has had as many years as the author had at growing, exhibiting, and judging roses.

Mr. Pugsley publishes in *The Wimbledon and Merton Annual* (Simpkin, Marshall & Co. 1904; price 2s. 6d.) an interesting paper on "Wimbledon Wild Flowers," with a list of 572 species, "recorded as growing about the Common, in the Park, or on the lower ground towards Merton and the Wandle": of these he has himself gathered 442 during the last ten years. A similar work has been undertaken by Mr. J. Cosmo Melvill, who contributes to the *History and Traditions of Prestwich* (near Manchester), by the Rev. W. Nicholls, recently published by Sutton, Manchester, an essay of twenty-eight pages on the flora of the district.

The eleventh part of Georg Roth's *Europäischen Laubmoose* (Leipzig: Engelmann. 1905. Pp. xvi, 641–733; plates li.–lxii. Price 4 marks) brings to a conclusion an important addition to bryological literature. The whole work contains upwards of 1300 pages of text, illustrated by 62 plates, on which are figured nearly 1250 mosses; and it has been published in the remarkably short period of a year and a half, in spite of the additional labour involved in getting together the requisite authentic specimens to fill in the blanks in the series. The special value of the work lies in the illustrations, every species being figured, some hundreds of them for the first time. This must prove a very great boon to students who have not access to a large herbarium. Still greater would have been the boon, however, had the author supplied keys to the genera and species, and stated the magnification of his figures. Unlike too many German authors, he has provided complete indexes to his work. As the author has cast his net over the moss-flora of all Europe, the usefulness of his work is vastly enhanced.—A. G.

Mr. Charles Bailey publishes in the *Memoirs of Manchester Literary and Philosophical Society* (vol. xlix. part 1) an account of the occurrence of *Sisymbrium strictissimum* L. at Heaton Mersey

from 1890 to 1904. It "occurs on the Lancashire side of the Mersey, in the grounds surrounding the works of Messrs. Mellard and Coward, Ltd., manufacturers. Mr. [J. E.] McDonald first noticed it at this station five or six years ago, and it has not only held its own amidst the other vegetation, but has steadily increased its area. The plant was first observed many years ago as growing outside the boundaries of the bleach-works, on the Stockport side, but last summer Mr. McDonald noticed it from the opposite bank of the Mersey, growing on a waste-heap on the west side of the bleach-works, its rich yellow corymbose flowering spikes making it sufficiently conspicuous in the mass. Mr. McDonald tells me that several Stockport botanists, besides himself, without being able to ascertain its name, have had the plant under their observation for many years, and have gathered it in the ground beyond the bleach-works; two of them gathered it in this station ten or twelve years ago; and a third has known it in the same spot for the last fifteen years. Its persistence may therefore be accepted as established. The open ground fronting the river to the west of the bleach-works is where the plant is most at home, and this may be the oldest colony of the plant, although the dates named in the preceding paragraph apply to plants gathered in the station to the east. The plant grows in clumps amongst the grass and other herbage for about fifty or sixty yards on the Stockport side of the works, as well as on the waste-heap at the back of the works. There are about twenty clumps in all, a dozen of which occur on the western side, and eight on the eastern side; two of the larger clumps would cover areas of about six square yards each. The plant grows to a height of two or three feet, or even more. Its associates are *Artemisia vulgaris*, *Cnicus arvensis*, *Urtica dioica*, and species of *Tragopogon* and *Scrophularia*, all of them plants of a character suggesting strong competition in its struggle for existence."

The *Transactions of the Botanical Society of Edinburgh* appear now at irregular and uncertain intervals. The last issue (vol. xxii. pt. 3), at the end of 1904, contains two important papers: one, by Prof. Trail, entitled "Suggestions towards the Preparation of a Record of the Flora of Scotland"; the other, by Mr. James Stirling, "Notes on a Census of the Flora of the Australian Alps."

We are indebted to the *Daily News* for the information that an "interesting exhibit" at a recent R.H.S. Show "took the form of a new specimen of orchid named the 'Brasso-cattlega-digbyano Schroderac-tankerville.' The flower," says the *Daily News*, "had a delicate blush tint"—no wonder!

The large British herbarium of Mr. F. Arnold Lees, which is especially rich in Yorkshire plants, has been acquired for the Cartwright Hall Museum, Bradford.

The National Herbarium has received an interesting collection made in Eastern Mongolia by Mr. C. W. Campbell, C.M.G., in 1902, during the journeys of which he published an account, with map, in *The Geographical Journal* for November, 1903.

Prof. F. W. Oliver and Major Prain have been elected Fellows of the Royal Society.

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BRITISH AND FOREIGN

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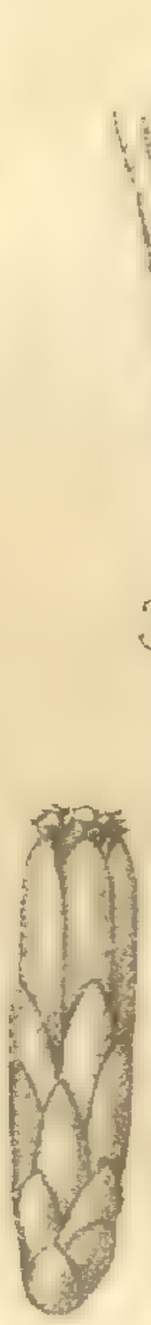

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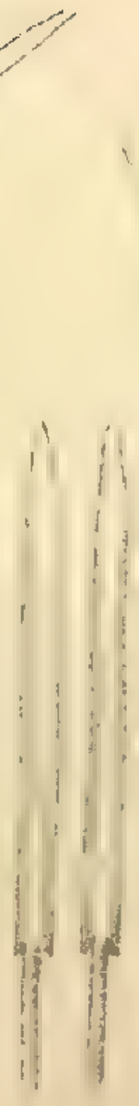

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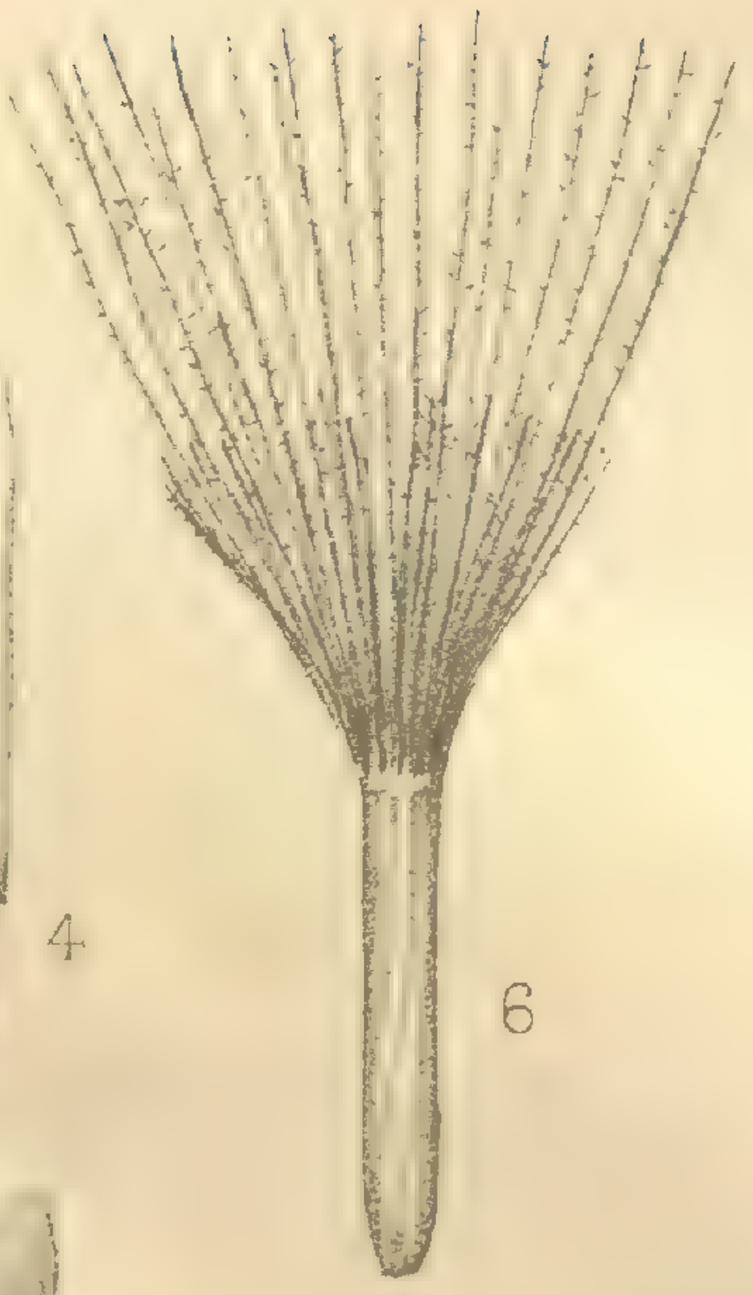

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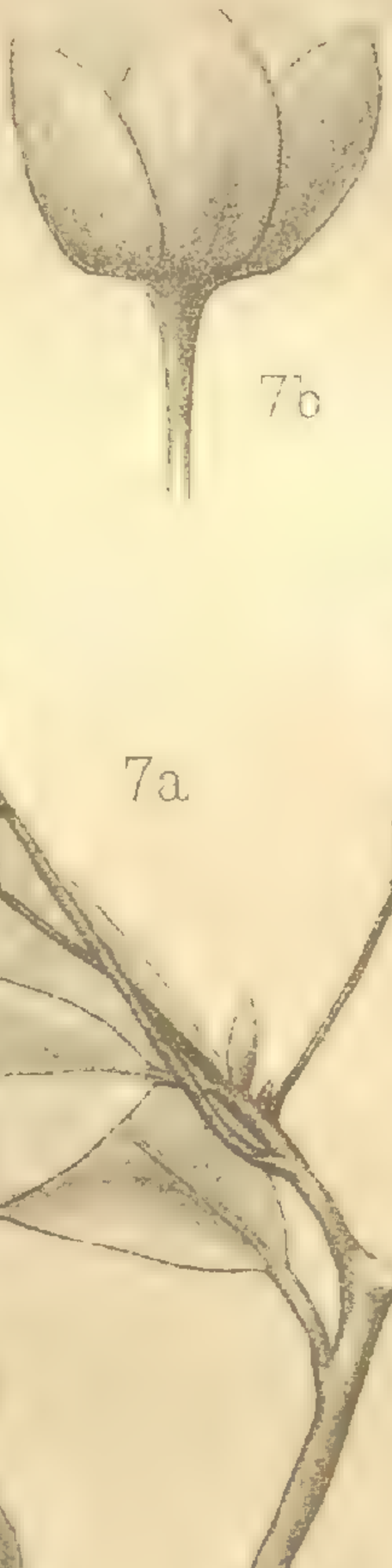

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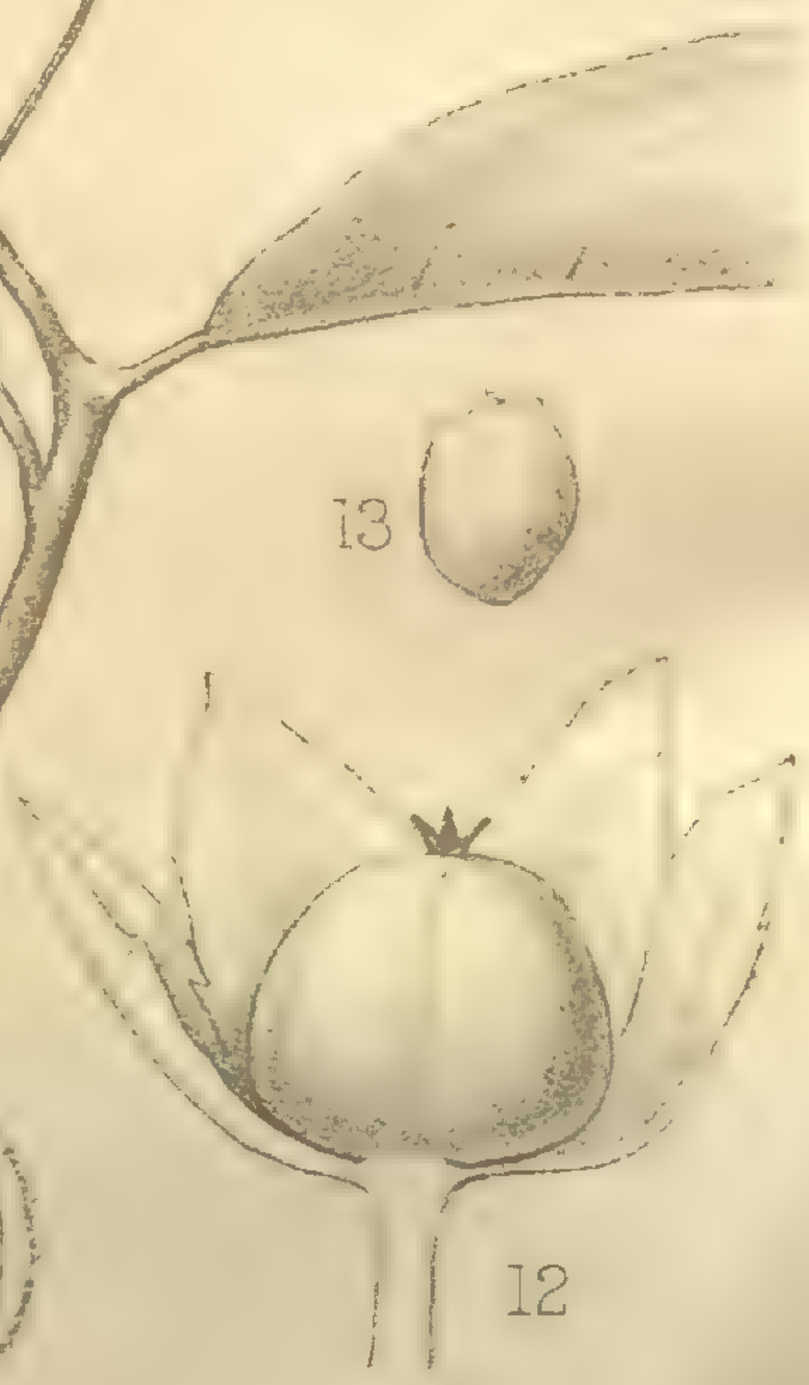

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1-6 Cratystylis conocephala.
7-13 Nepenthandra lanceolata.

ALABASTRA DIVERSA.—Part XII.

By Spencer le M. Moore, B. Sc., F.L.S.

(Plate 471.)

Sertulum Asiatico-Australiense.

The Asiatic plants described in the following memoir include a few which Major Melville, R.A.M.C. collected between November, 1903, and January, 1904, in the Shan States, and Mr. F. N. Garry presented on his behalf to the National Herbarium. Although small, the collection is of much interest, as it contains, besides the novelties, several rare species hitherto not represented at the Museum. Major Melville also sends two *Gamopetalæ* till now unrecorded, from the Shan States, viz. *Lettsomia hirsutissima* C. B. Cl. and *Strobilanthes Dalhousieanus* C. B. Cl. A Tenasserim plant in herb. Beddome, and two species from a very large and important collection made in Central China by Father Hugh Scallan, complete the list of continental novelties. The remainder are Australian, except three from the Philippine Islands presented to the Museum by the late Mr. John Whitehead.

Rubiaceæ.

Mussænda breviloba, sp. n. Ramulis teretibus crebro foliosis ferrugineo-tomentosis, foliis subsessilibus ellipticis utrinque angustatis breviter acuminatis subcoriaceis supra pubescentibus subtus molliter griseo-tomentosis, stipulis a basi lata triangulari-subulatis acutis, cymulis dilute fulvo-tomentosis 5–9-floris in corymbis sublaxis foliis brevioribus dispositis, pedicellis quam calyx brevioribus, bracteis bracteolisque subulatis, calycis turbinati tomentosi lobis ad normam generis perbrevibus lanceolato-subulatis acutis uno cymulæ cujusque in laminam unguiculatam ovatam acutam pubescentem expanso, corolla quam calyx circa 3-plo longiore tubo extus tomentoso deorsum attenuato sursum subito dilatato lobis maxime abbreviatis triangularibus breviter acuminatis, antheris apice acutis, bacca ——.

Hab. Shan States, roadside at Kalau, 4000 ft.; *Major Melville.*

Folia 6·0–10·0 cm. × 3·5–5·0 cm., summa circa 4·0 cm. × 1·8 cm.; costæ secundariæ utrinque 8, leviter arcuatæ, angulo fere 45° costæ centrali inserta et ut eadem subtus eminentes necnon plus minus ferrugineæ. Stipulæ 0·4–0·5 cm. long. Corymbi circa 4·5 cm. long., 7·0–8·0 cm. diam. Pedicelli 0·1–0·2 cm., bracteæ modice circa 0·5 cm., bracteolæ 0·1–0·2 cm. long. Calyx totus 0·35–0·45 cm. long.; lobi 0·2 cm. long., rarius paullulum longiores. Corolla 1·5 cm. long.; tubus inferne vix 0·1 cm. faucibus 0·23 cm. diam.; lobi 0·22 cm. long. Antheræ lineares 0·4 cm. long.

A very distinct plant, known at once from species near it by reason of the very short and relatively broad lobes to the calyx. These lobes are probably persistent, though in the absence of fruit this must remain doubtful.

COMPOSITÆ.

Aster philippinensis, sp. nov. Perennis, ramis erectis gracilibus sparsim foliosis puberulis, foliis parvis breviter petiolatis ovato-lanceolatis acutis vel breviter acuminatis basi rotundatis integris vel apicem versus denticulatis subcoriaceis utrinque scabridis, capitulis parvulis heterogamis radiatis 20-flosculosis in corymbo pluricephalo satis laxo frequenter bracteato digestis, pedunculis propriis capitula sæpissime subæquantibus, involucri campanulati microscopice puberuli phyllis 5-serialibus oblongis obtusis membranaceis apice decoloribus et fere evanide herbaceis extimis abbreviatis interioribus gradatim longioribus, receptaculo convexiusculo foveolato, flosculis exsertis, ligulis 11 anguste oblongis apice brevissime 3-denticulatis, styli ramorum appendicibus lanceolatis breviter acuminatis, achæniis crudis compressis ecostatis piloso-hispidis, pappi setis inter se parum inæqualibus sordide albis.

Hab. Luzon, highlands of Lepanto, 5000–7000 ft.; *John Whitehead.*

Rami 0·13 cm. diam., longitrorsum striatuli. Folia 2·0–3·0 cm. × 1·0–1·2 cm., in sicco olivacea; petioli 0·2 cm. long. Corymbi 5·0–7·0 cm. diam. Bracteæ in folia transeuntia, juniores 0·2–0·5 cm. long., lanceolatæ. Pedunculi proprii graciles, solemniter 0·7–1·0 cm. long. Capitula 0·8 × 1·0 cm. Involucri phylla extima 0·2 cm., interiora ± 0·4 cm., intima 0·6 cm. long., omnia superne purpurascentia. Ligulæ verisimiliter albæ, 0·7 × 0·1 cm. Corollæ disci 0·7 cm. long., harum lobi 0·25 cm. long. Styli rami in toto 0·15 cm. appendix sola 0·06 cm. long. Achænia 0·12 cm., pappus circa 0·5 cm. long.

A very distinct species, easily known by the slender habit coupled with the small leaves and small *Vernonia*-like heads.

Cratystylis.

Compositarum e tribu *Inuloidearum* genus novum.

Capitula homogama, disciformia, paucifloscula, flosculis omnibus bisexualibus. Involucrum cylindricum vel anguste turbinatum, phyllis pluriseriatis imbricatis latis obtusis membranaceis interioribus gradatim longioribus. Receptaculum parvum, planum, nudum. Corolla angusta, sursum leviter ac gradatim dilatata, adusque medium vel minus alte 5-fida. Antheræ connatæ vel inter se liberæ, basi breviter caudatæ vel brevissime apiculatæ vel exappendiculatæ. Styli maxime incrassati rami elongati, complanati, lineares, apice obtusiusculi, glabri vel dorso puberuli. Achænia oblonga vel turbinata, compressiuscula, pluristriata, glabra. Pappi setæ tenues, pauciseriatæ, ima basi connatæ, inter se inæquilongæ, serrulatæ vel barbellatæ. — Suffrutices humiles, pubescentes vel tomentosæ. Folia parva, alterna, sessilia, integerrima. Capitula submediocria, ramulos ultimos solitatim terminantia, sessilia.

Cratystylis conocephala. (Plate 471, figs. 1–6.) Ramis ramulisque compactis griseo-tomentosis deinde glabrescentibus et foliorum delapsorum basubus persistentibus onustis, foliis obovatis oblanceolatisve obtusissimis cauli approximatis utrinque griseo-

tomentosis, capitulis 4–5-flosculosis, involucri cylindrici circa 6-serialis phyllis exterioribus ovato-oblongis interioribus multo longioribus oblongis, flosculis subexsertis, corollæ lobis quam tubus multo brevioribus, antheris inter se liberis basi brevissime apiculatis, stylo crassissimo ejus ramis glabris, achæniis oblongis, pappi setis barbellatis stramineo-rubiginosis. *Eurybia conocephala* F. Muell. in Trans. Vict. Inst. i. 36. *Olearia conocephala* F. Muell. Frag. v. 79; Benth. Fl. Aust. iii. 480; Diels & Pritzel in Bot. Jahrb. xxxv. 604. *Pluchea conocephala* F. Muell. in Trans. Roy. Soc. Vict. xxiv. 138; F. Muell. & Tate in Trans. Roy. Soc. S. Aust. xvi. 365.

Hab. South Australia, Fowler's Bay; *R. Brown*, &c. West Australia, Queen Victoria Spring to Fraser Range and Lake Lefroy; *R. Helms* (Elder Expedition). Gilmore's, Coolgardie District; *Diels*. Also in the interior of New South Wales and Victoria.

Planta saltem 12·0 cm. alt. Ramuli modice 0·15 cm. diam. (rami 0·2–0·4 cm.). Folia 0·5–0·8 cm. long., 0·3 cm. lat. Capitula in toto circa 1·3 cm. long., 0·4 cm. diam. Involucri phylla extima 0·35 cm., interiora 0·5–0·8 cm., intima 1·2 cm. long. Corolla glabra, 1·0 cm. long.; lobi lineares, obtusiusculi, 0·15 cm. long. Antheræ 0·23 cm. long. Stylus glaber, 0·9 cm. long., ejus rami vix 0·3 cm. long. Achænia 0·55 cm., pappi setæ 0·8–1·1 cm. long.

Cratystylis microphylla, sp. nov. Ramuli compacti ut folia fulvo-tomentosi, foliis minimis cauli applicatis oblongis obtusis, capitulis cylindricis 1–2-flosculosis, involucri 5-serialis phyllis lineari-oblongis, flosculis subexertis, corollis adusque ¼-fidis, antheris connatis basi exappendiculatis, styli ramis glabris, achæniis maxime crudis oblongis, pappi setis serrulatis sordide albis. *Pluchea conocephala* F. Muell. var. *microphylla* F. Muell. & Tate in Trans. Roy. Soc. S. Aust. xvi. 365 (nomen tantum).

Hab. West Australia, Lake Lefroy; *R. Helms*.

Planta circa 14·0 cm. alt. Rami nudi, sat crassi, in sicco fusci. Ramuli inferne efoliati, vix 0·1 cm. diam. Folia 0·15–0·25 cm. × ± 0·1 cm.; costa centralis dorso eminens. Capitula pansa circa 1·0 cm. long. Involucri phylla margine ciliolata, extima 0·3 cm., intermedia 0·45–0·7 cm., intima fere 1·0 cm. long. Corolla glabra, in toto 0·8 cm. long.; lobi fere 0·2 cm. long. Antheræ 0·15 cm. long. Styli rami 0·22 cm. long. Achænia 0·3 cm., pappi setæ 0·35–0·6 cm. long.

Cratystylis subspinescens, sp. nov. Ramis ramulisque valde divaricatis sparsim foliosis minute pubescentibus, foliis linearibus obtusis sub lente tomentosis, capitulis pro rata parvis cylindrico-turbinatis 5-flosculosis, involucri pubescentis 6-serialis phyllis extimis ovatis interioribus ovato-oblongis intimis oblongis, flosculis inclusis, corollis usque ad medium partitis, antheris connatis basi breviter etsi distincte caudatis, styli ramis dorso puberulis, achæniis minimis late turbinatis, pappi setis apice serrulatis sordide albis.

Hab. West Australia, near Hunt's Well; *R. Helms*.

Folia modice 0·6–fere 1·0 cm. × 0·1–0·15 cm.; costa media pag. inf. eminens. Capitula 0·8 cm. long., humectata 0·3 cm. diam. Involucri phylla extima 0·2 cm., intermedia 0·4–0·5 cm., intima

0·6 cm. long. Corollæ in toto 0·6 cm., harum lobi 0·3 cm. long. Antheræ 0·35 cm. long. Stylus 0·4 cm., rami 0·25 cm. long. Achænia cruda modo 0·06 cm., pappus 0·6 cm. long.

The characteristic points of the species above proposed contrast as follows :—

Branches compact. Leaves obovate or oblanceolate, at least 5 mm. long. Heads 4–5-flosculed. Tube of corolla nearly six times as long as the lobes. Anthers free. Style-arms glabrous . . . . . *C. conocephala.*

Branches compact. Leaves oblong, not exceeding ½ mm. long. Heads 1–2-flosculed. Tube of corolla about three times as long as the lobes. Anthers connate. Style-arms glabrous . . . . . *C. microphylla.*

Branches divaricate. Leaves linear. Heads 5-flosculed. Tube of corolla not longer than the lobes. Anthers connate. Style-arms puberulous at the back . *C. subspinescens.*

The genus is a very interesting and curious one. Originally referred by Mueller to *Eurybia* (*Olearia*), it was only with much hesitation that Bentham followed this lead. He writes (*loc. cit.*), under *O.? conocephala* : "The species has not the style of *Olearia*, and there are no female florets. I also found the anthers quite free in all the flowers I examined, but that may not be constantly the case. Notwithstanding these anomalies, as I know of no genus to which it is more nearly allied, I have left it in *Olearia* as described by Mueller." One can only marvel why, under these circumstances, Bentham did not take the obvious course of placing in a genus by itself a plant which, as he shows, possesses such peculiarities, and the wonder is increased on finding only a cursory and inaccurate reference to *O. conocephala* in his masterly exposition of the *Compositæ* in the *Genera Plantarum* (vol. ii. p. 227). Plainly *Olearia* is not the place for these plants, as, leaving out the homogamous heads, not only are the style-arms emphatically not those of *Asteroideæ*, but, contrary to what Bentham says, I find the anthers of *C. conocephala* appendaged at the base, though very shortly so, it is true. And here a curious anomaly is revealed. The three plants are undoubtedly congeneric, though, as shown above, there are far too many points of difference between them to justify their being considered conspecific. And yet, while in one of them there are very short anther-appendages, and in the second none at all, the third has anthers provided with distinct tails! This seems to reveal an *Inuloideous* affinity, although one cannot for a moment, in spite of Mueller's authority, relegate them to *Pluchea* or its immediate allies, seeing that the structure of the capitula is so different.

After much cogitation, I conclude that *Cratystylis* should be included among the *Inuloideæ*, though without being able to fix upon an affinity for it in that tribe. It may be added that but for the flattened style-arms, a *Vernoniaceous* affinity might be defended, and perhaps with more than plausibility. In all three the styles are thickened (hence the generic name—Gr. κρατύς, strong), and

those of *C. conocephala* especially so. To this must, I think, be ascribed the free condition of the anthers of the last named species. At a very early stage they are probably united, only to be separated when the style swells out. This supposition is supported by the slight cohesion between the anthers of the other two species, in which the stylar thickening is not so pronounced, with consequent lessening of the strain upon the anthers.

The only specimens in the British Museum are two of *C. conocephala* collected by Robert Brown at Fowler's Bay. Brown seems never to have examined the plant, as I have searched in vain among the Brown MSS. for a description. The other two descriptions were drawn up from Elder Expedition specimens in the Kew Herbarium.

Placus Solandri, sp. nov. Subscapiformis, haud glandulosa, caule brevi attenuato pubescente pilosove, foliis radicalibus pluribus rosulatis sæpissime obovatis vel oblanceolatis acutis sessilibus et breviter amplexicaulibus vel in petiolum brevem sensim angustatis margine dentatis membranaceis strigoso-puberulis nonnunquam fere glabris additis paucis caulinis sessilibus linearilanceolatis integris vel dentatis, capitulis in paniculis longipedunculatis paucicephalis laxis dispositis, pedunculis folia multoties excedentibus glabris, pedunculis propriis gracilibus capitula sæpissime bene excedentibus glabris, involucri campanulati puberuli phyllis linearibus acuminatis exterioribus manifeste brevioribus, flosculis hermaph. 6–12 horum styli ramis angustissimis complanatis obtusiusculis, achæniis angulatis appresse setulosis paucicostulatis, pappi setis diuscule persistentibus sordide albis.

Hab. Queensland, Endeavour River, 1770; *Banks & Solander*. Shoal Water Bay, Aug. 30th, 1802; *R. Brown*, no. 2097.

Herba e schedis beat. R. Brown "erecta, simplex vel parum ramosa, spithamea-sesquipedalis." Folia solemniter 3·0–6·0 cm. long., radicalia 1·0–2·0 cm. lat., caulina sæpissime 0·5–1·0 cm. lat. Inflorescentia summum 30·0 cm. long., sæpe vero brevior; pedunculi bracteati bracteis paucis inferioribus foliis caulinis conformibus sed minoribus superioribus anguste linearibus ± 0·3 cm. long. Paniculus ipse circa 4·0 cm. long. Pedunculi proprii modice 0·5–2·0 cm. long. Capitula 0·65 × 0·6 cm. Involucri phylla extima 0·15 cm., intermedia 0·3–0·4 cm., intima 0·6 cm. long. Fll. fem. corollæ fere 0·4 cm. long., fll. hermaph. paullulum longiores. Antherarum caudæ tenuissimæ. Achænia 0·1 cm., pappus 0·5 cm. long.

This can be at once distinguished by the rosette of radical leaves and the lax few-headed glabrous panicles. Brown's specimens, as also one of Banks & Solander's, show a tendency towards some Australian specimens (notably R. Brown, no. 2096), referred by Bentham to *B. glandulosa* DC., although they look very unlike that species. From these, however, the present plant can be told *inter alia* by the absence of a glandular hairy clothing.

Crassocephalum latifolium, sp. nov. Verisimiliter scandens, glabrum, foliis late ovatis obtuse acutis basi latissime truncatis

rarius obscure cordatis margine inæqualiter lobulatis necnon dentatis lobulis dentibusque acutis vel obtusis membranaceo-carnosulis, petiolis sat longis basi 2-auriculatis, capitulis campanulatis homogamis in axillis summis solitariis addito corymbo terminali brevi paucicephalo, pedunculis propriis elongatis attenuatis bracteis anguste linearibus solitariis paucisve sæpissime onustis, involucri subuniserialis phyllis anguste lineari-lanceolatis obtusis margine membranaceis dorso 2–6-costatis, calyculi phyllis paucis parvis angustis, flosculis exsertis, corollis prolixis tubo sursum subito amplificato lobis lineari-lanceolatis obtusis, antheris basi microscopice auriculatis, styli ramis longe exertis, achæniis adhuc valde crudis attenuatis 5-striatis glabris, pappi setis scabriusculis albis.

Hab. Philippines, Negros Island; *John Whitehead.*

Foliorum lamina 4·0 × 3·0–4·0 cm., basi 5-nervis, nervibus ascendentibus marginem versus late dichotomis; lobuli summum 0·5 cm. long., sed solemniter breviores; petioli 1·5–2·5 cm. long., horum auriculæ ovatæ, 0·5–0·8 cm. long. Pedunculi proprii adusque 7·0 cm. long., sæpius equidem breviores sc. ± 3·0 cm.; horum bracteæ 0·2–0·5 cm. long. Capitula pausa circa 1·5 cm. long. et 1·3 cm. diam. Calyculi phylla circiter 0·4 cm. long. Involucri phylla 1·2 cm. long., 0·1–0·2 cm. lat. Corollæ tubi pars attenuata 1·0 cm. pars ampliata 0·25 cm. long.; lobi 0·15 cm. Styli rami 0·45 cm. long. Achænia ægre 0·2 cm., pappus 1·2 cm. long.

Known easily by the broad lobulate leaves truncate or even slightly cordate at base, together with the lengthily pedunculate heads.

Senecio (Eu-Senecio) **Hugonis,** sp. nov. Herbaceus, caule ascendente folioso dense fulvo-araneoso-tomentoso, foliis lanceolato-oblongis obtusis acutisve basin versus in petiolum brevem angustatis margine denticulatis dentibus fuscis debilibus supra laxe araneosis subtus dense griseo-tomentosis, capitulis submediocribus heterogamis discoideis in corymbis brevibus pluricephalis ex axillis summis oriundis necnon in corymbo terminali dispositis, corymbis dense tomentosis bracteis foliis similibus nisi omnimodo imminutis onustis, involucri subhemisphærici dense tomentosi phyllis uniserialibus 14 lineari-oblongis acutis apice brevissime sphacelatis, calyculi phyllis circa 8 anguste linearibus quam involucrum paullo brevioribus, receptaculo plano breviter fimbrillifero, flosculis luteis circa 26 paucis extimis femineis quam reliqui paullo minoribus, antheris ex involucro eminentibus basi setaceo-caudatis, styli ramis truncatis penicillatis, achæniis valde crudis anguste cylindricis piloso-puberulis obscure costatis, pappi setis scabriusculis albis.

Hab. China, No-mi-san Mt., Sze-chuen Province; *Father Hugh Scallan.*

Folia firme membranacea, summum 8·0 × 3·0 cm., sæpius vero 2·5–5·0 × 1·5–2·0 cm.; costæ secundariæ utrinque 7–8, leviter arcuatæ, subtus prominentes; petioli circa 0·5 cm. long. Corymbi dense tomentosi, modice circiter 5·0 cm. long. Pedunculi proprii saltem 0·5 cm. long. Bracteæ ± 1·5 cm. long. et 0·2 cm. lat. Calyculi phylla 0·5 cm. long. Capitula 0·7 cm. long. et diam. Involucri phylla 0·6 cm. long. Corollæ hermaph. 0·55 cm., corollæ

fem. 0·4 cm. long. Antheræ omnino exsertæ, 0·2 cm. long. Achænia 0·1 cm., pappus 0·5 cm. long.

A very distinct plant, somewhat like *S. nagensium* C. B. Cl. in general appearance, but quite different in the flowering-heads.

Carduus sinensis, sp. nov. Caulibus simplicibus monocephalis bene foliosis alato-spinosis scabridis, foliis longe decurrentibus oblongo-lanceolatis spinose acuminatis ut alæ margine crebro spinoso-lobulatis dentatisve supra glabris subtus albo-floccosis, capitulis majusculis solitariis multifloscul osis, involucri subhemisphærici multiserialis aliquantulum araneosi phyllis anguste linearibus superne attenuatis apice spinose acuminatis exterioribus mox patentibus recurvisve quam interiora plane brevioribus intimis quam interiora longioribus et latioribus et scabridis, receptaculo plano, flosculis exsertis, corollæ tubo sursum ampliato parte ampliata fere adusque medium 5-fida, antherarum caudis paullo laceratis, styli ramis brevibus, achæniis adhuc valde crudis oblongis compressis apice breviter umbonatis pluristriatis, pappi setis serrulatis sordidis.

Hab. China, Kusan, Shensi Province; *Father Hugh Scallan.*

Planta semimetralis vel paullo elatior. Folia 5·0–8·0 cm. × 0·8–1·0 cm., summa vero imminuta et in involucri phylla transeuntia, membranacea, pag. sup. aliquantulum nitida; lobuli dum adsint triangulari-deltoidei, spina terminali haud exempta 0·6 cm. long. Capitula 3·5 cm. long., 2·7 cm. diam. Involucri phylla exteriora circa 0·7 cm., interiora 1·3 cm., intima fere 2·5 cm. long. Receptaculi setæ 1·0 cm. long. Corollæ in toto 2·5 cm. long.; tubi pars angusta 1·3 cm., pars amplificata 0·7 cm., lobi 0·5 cm. long., hi lineares, obtusi. Antheræ subinclusæ, 0·8 cm. long. Stylus ad 0·5 cm. extra antheras exsertus, ejus rami 0·075 cm. long. Achænia 0·3 cm., pappus 1·5 cm. long.

Nearest *C. leucophyllus* Turcz., but differing from it in the leaves, in the shape of the capitula, in the exceedingly narrow involucral leaves, &c.

Gentianeæ.

Gentiana (§ Stenogyne) **Melvillei,** sp. nov. Verisimiliter annua sparsim ramosa, ramis gracillimis 4-angularibus angulis evanide cartilagineo-ciliolatis deorsum glabris, foliis radicalibus ignotis caulinis breviter petiolatis ovatis obtusiusculis basi rotundatis marginibus serrulatis minutissimeque cartilagineo-ciliolatis trinervibus crassiusculis glabris subtus pallidis, floribus ramulos breves singillatim terminantibus a foliorum pari summo involucratis, calyce ægre adusque medium partito breviter 4-alato lobis e basi lata brevissima subulatis breviter acuminatis, corollæ in sicco dilute luteæ calycem 3-plo excedentis tubo infundibulari lobis ovatis obtuse acutis plicis unilateralibus denticulatis quam lobi brevioribus præditis, ovario elongato anguste oblongo breviter stipitato stylo bene evoluto manifeste longiore, stigmatibus revolutis, seminibus ambitu oblongo-ovatis alteris (abortivis ?) compressis alteris pinguioribus angulatis minute scrobiculatis.

Hab. Shan States, wayside at Pyinsamben, 3000 ft.; *Major Melville.*

Caulis 0·07 cm. diam., in sicco atropurpurea. Folia 0·6–0·7 cm. × 0·5 cm.; petioli complanati, 0·1–0·2 cm. long. Calyx totus 1·0 cm. long., 0·4 cm. lat. vel paullulum majus; lobi 0·4–0·45 cm. long., erecti vel apice paullulum recurvi. Corolla 2·5 cm. long.; tubus 0·5–0·6 cm. diam.; lobi 0·6 cm. long., plicas adusque 0·3 cm. superantes. Gynophorus 0·2 cm. long. Ovarium 1·0 cm. long., 0·15 cm. diam. Stylus 0·75 cm., stigmata 0·2 cm. long. Semina 0·08 cm. long.

Apparently near *G. filicaulis* Hemsl., and so far as concerns the leaf, very like *G. primuliflora* Franch., but easily distinguished from this latter on a superficial view by the relatively long calyx-lobes.

In the absence of a note as to the colour of the flowers, it is difficult to say what this is. Probably a pale mauve, such as one sometimes sees in the case of *G. Amarella* L.

Convolvulaceæ.

Lettsomia Melvillei, sp. nov. Scandens caule volubili tereti dense fulvo-pubescente, foliis petiolatis rotundato-ovatis obtusis vel obtusissimis basi rotundatis levissimeque cordatis supra pilis strigosis adpressis præsertim secus nervos exemptis glabris subtus appresse strigoso-pubescentibus, cymis foliis æquilongis paucifloris dense pubescentibus, pedicellis quam calyx sæpius longioribus, calycis parvi sericeo-pubescentis lobis ovato-rotundatis obtusissimis, corolla mediocri calycem multoties excedente anguste campanulata extus appresse sericeo-villosa lobis brevibus latissimis truncatis, staminibus inclusis, antheris lineari-oblongis, ovario 2-loculari 4-ovulato, stigmate 2-globoso, fructu ——.

Hab. Shan States, garden of bungalow at Pyinsamben, 3000 ft.; *Major Melville.*

Foliorum maturorum lamina 10·0–13·0 cm. × 10·0–11·0 cm., firme membranacea, subtus pallidior; costæ secundariæ utrinque 8–12, ascendentes, paucis basalibus majus approximatis et angulo recto vel fere recto costæ mediæ insertis. Cymarum pedunculus circa 6·0 cm. long. Pedicelli 0·5–1·0 cm. long. Calyx modo 0·5 cm. long. Corolla sicca 3·5 cm. long., 3·0 cm. diam.; tubus basi 0·5 cm. faucibus 2·0 cm. diam.; lobi humectati 0·65 cm. long. Filamenta 1·2 cm. long., basi dilatata necnon barbellata; antheræ 0·5 cm. long. Discus 0·15 cm. alt. Ovarium ovoideum, circa 0·4 cm. long. Stylus circa 1·0 cm. long., glaber.

A plant somewhat like *L. setosa* Roxb., but at once known from it by the few-flowered lax cymes and the very small calyces.

Since the fruit is not to hand, there is some doubt about the genus to which this should be referred, though everything points to its ultimately proving a *Lettsomia* and not an *Ipomæa*.

Scrophulariaceæ.

Lindenbergia Melvillei, sp. nov. Ramis ascendentibus crebro foliosis glanduloso-hirsuto-pubescentibus dein glabrescentibus, foliis parvis breviter petiolatis anguste ovatis breviter acuminatis margine serratis basi acutis pubescentibus mox puberulis, spicis terminalibus densifloris folia excedentibus hirsuto-pubescentibus, bracteis ovato-

lanceolatis acuminatis, calycis glanduloso-pubescentis adusque ½ divisi lobis anguste lanceolatis acutis, corolla calycem fere 3-plo excedente tubo latissimo labio inferiore amplissimo undulato emarginato extus glanduloso-pubescente labio superiore quam inferius breviore lato apice bifido infra apicem utrinque unidentato, ovario ovoideo glabro, capsula anguste oblongo-ovoidea acuminato ex calyce breviter eminente.—*L. philippensis* Hook. fil. Fl. Brit. Ind. iv. 261 (pro parte); Forbes & Hemsl. Ind. Fl. Sin. ii. 184 (cum syn.); Collett & Hemsl. in Journ. Linn. Soc. xxviii. 99, nec Benth.

Hab. Shan States, Hopong, 3000 ft.; *Major Melville*. Shan States; *Manders*, 47 in Herb. Kew. China, Hupeh; *Henry*, 1156, &c.

Foliorum lamina 2·5–3·5 × 1·0–1·5 cm.; petioli 0·5–0·7 cm. long. Spicæ tandem 10·0 cm. long. Bracteæ ± 0·5 cm. long. Calyx 0·5 cm. long., 0·4 cm. diam. Corolla 1·3 cm. long.; tubus 0·5 cm. diam. Labium anticum 0·75 cm. long., 0·8–0·9 cm. lat.; labium posticum 0·5 cm. long., ægre 0·4 cm. lat. Antheræ 0·1 cm. diam. Capsula 0·6 cm. long.

Referred by authors to *L. philippensis* Benth., but a different-looking plant with quite different flowers. In support of this statement the following floral characters of *L. philippensis* may be contrasted with those given above of *L. Melvillei*. Calyx divided one-third down with short and obtuse lobes. Corolla at most 0·9 cm. long, the tube slender and only 0·2 cm. in diameter. Lips of the corolla much smaller and narrower, especially the entire upper lip. Anthers only 0·05 cm. in diameter.

Myoporineæ.

Eremophila (§ Platychilus) **pustulata**, sp. nov. Glabra, copiose ramosa, ramis ramulisque rigidis his gracilibus bene foliosis ut folia pustuiis resinosis perspicuis sparsim obsitis, foliis alternis rarissime oppositis sessilibus lineari-oblanceolatis obtusis vel obtusissimis coriaceo-carnosulis, floribus pro rata mediocribus in axillis summis solitariis, pedicellis gracilibus folia æquantibus, calycis lobis valde imbricatis ac revera 2 fere omnino interioribus ovato-lanceolatis acutis sparsissime pustuliferis intus glanduloso-pubescentibus obscure nervosis herbaceis, corolla basin versus subito attenuata labii postici lobis comparate brevibus triangulari-ovatis acutis labii antici lobis lateralibus anguste ovato-oblongis acutis lobo intermedio late oblongo-ovato apice truncato, staminibus inclusis, ovario villosulo, stylo incluso piloso-puberulo, ovulis quove in loculo 2 superpositis.

Hab. Coolgardie district, West Australia; *L. C. Webster*.

Ramuli modo 0·1 cm. diam., reliquuis foliorum evanidorum sæpe tuberculati. Folia 0·5–1·2 cm. long., 0·15–0·27 cm. lat., ascendentia, juvenilia imbricata. Pedunculi 0·6–1·0 cm. long. Calycis lobi inter se parum inæquales, 0·55–0·6 × 0·25–0·3 cm., interiora ciliata, exteriora passim ciliolata. Corollæ extus glabræ intus antice pubescentis tubus 1·0 cm. long., ima basi 0·3 cm., paullulum altius 0·2 cm., faucibus 0·8 cm. diam.; labia 0·85 cm. long.; labii post. lobi 0·3 cm, long., basi 0·25 cm. lat.; labii ant, lobi 0·8 cm. long., laterales 0·35 cm., intermedius 0·65 cm. lat. Filamenta prorsus

glabra. Discus 0·1 cm. alt. Ovarium 0·25 cm. long., stylus 1·2 cm. De fructu sileo.

To be inserted in the genus next to *E. Drummondii* F. Muell., but with quite different foliage and, among other points, a hairy instead of a glabrous ovary.

Labiatæ.

Pogostemon philippinensis, sp. nov. Ramulis gracilibus appresse pubescentibus sparsim foliosis, foliis petiolatis oblongo-ovatis obtusis inferne obtusissimis vel etiam paullulum rotundatis margine dentato-crenulatis supra appresse piloso-puberulis subtus sparsim pubescentibus, verticillastris equalibus approximatis per-paucis infimis vero distantibus in racemo terminali pubescente dispositis, bracteis quam calyces multo brevioribus ovatis vel ovato-lanceolatis ultimis anguste linearibus, calycis pubescentis lobis triangulari-deltoideis acutis, corollæ extus glabræ tubo e calyce breviter eminente, filamentis longibarbatis, antheris ovoideis, nuculis ——.

Hab. Luzon, highlands of Lepanto; *John Whitehead.* (Also, at Kew, Panay, Province of Ilo-ilo; *Vidal*, 3421.)

Ramuli vix 0·2 cm. diam. Foliorum limbus ± 5·0 × 2·0–3·0 cm., firme membranaceus, in sicco fuscus; petioli 1·0 cm. long., pubescentes. Inflorescentia tota 10·0 cm. long., et 1·3 cm. diam. Bracteæ 0·2–0·3 cm. long. Calyx 0·6 cm. long.; lobi 0·12 cm. Corollæ tubus 0·65 cm. long.; labium posticum 0·3 × 0·15 cm., anticum 0·45 × 0·3 cm. Filamenta 1·0 cm. long. paullulum excedentia. Stylus puberulus, 0·8 cm. long.

Known by the slender branches, the leaves, the slender inflorescences, &c.

Scutellaria (Galericularia § Genuinæ) **semicircularis,** sp. nov. Verisimiliter herbacea, caulibus simplicibus dense ac patule pubescentibus, foliis breviter petiolatis ovatis obtusis basi rotundatis crenato-serratis supra scabriusculis subtus pubescentibus, floribus oppositis secundis pedicellatis vetustioribus ex axillis foliorum summorum junioribus bractearum foliis similium sed minorum oriundis, pedicellis calycem paullo excedentibus, calyce ut corollæ tubus patule glanduloso-pubescente squama quam lobus posticus multo majore, corollæ cyaneæ tubo basin versus incurvo faucibus parum dilatatis limbi comparate magni labio postico maxime curvato ac revera fere semicirculari emarginato lobis lateralibus cum postico conjunctis lobo antico latissimo lateribus reflexis, filamentis glabris, staminum anticorum antherarum loculo altero obsoleto, disco obliquo, ovario gynostegio oblique imposito, nuculis depressis hispidulis.

Hab. Shan States, roadside, Hopong, 3000 ft.; *Major Melville.*

Folia modice 2·0 cm. long., 1·3–1·5 cm. lat., in sicco viridia, subtus pallida; petioli 0·2–0·3 cm. long., glanduloso-pubescentes. Bracteæ superiores gradatim imminutæ, majores 1·0 cm. juvenilia 0·4 cm. long. Pedicelli 0·25–0·4 cm. long, Calycis florentis tubus 0·15 cm. labia 0·5 cm. long.; labii postici squama rotundata, 0·3 ×

0·3 cm. Corollæ tubus 0·7–0·8 cm. long., basi 0·075 cm. faucibus 0·2 cm. lat.; labium posticum humectatum circa 0·7 cm. long.; lobi laterales rotundatæ fere 1·5 cm. long.; labium anticum 0·8 cm. long., 0·7 cm. lat., palato piloso-puberulo. Antheræ longiores 1·3 cm., breviores 1·1 cm. long. Stylus glaber, 2·2 cm. long.

To be inserted in the genus near *S. rivularis* Wall. Known at once by the greatly curved upper lip of the blue corollas.

Proteaceæ.

Hakea suberea S. Moore in Journ. Linn. Soc. (Bot.) xxxiv. 223. (*H. lorea* F. Muell. & Tate in Trans. Roy. Soc. S. Aust. xvi. 362, non R. Br.).—Mr. W. V. Fitzgerald says of this (Journ. Proc. Mueller Bot. Soc. no. xi. 60): "The Eastern goldfields form of this species has been recently described as a distinct species, under the name of *H. suberea* by Moore. Having examined specimens of the typical *H. lorea* and compared them with the goldfields plant, I failed to observe any combination of characters of sufficient importance to justify the creation of a new species." On the other hand, in the place above cited I have remarked: "Two congeners more easily separable it would be scarcely possible to find."

The "type" of the species, which, of course, is at the British Museum, is a plant found by Robert Brown at Shoal Water Bay, on the Queensland coast. Bentham (Fl. Aust. v. 496) gives only one locality outside Queensland for *H. lorea*—*viz.* Attack Creek, in Northern Australia. The value of his determinations is, however, discounted by the observation (*l. c.*) here following: "Several of the above-quoted specimens are not in flower, and are therefore in some measure doubtful." Except for the Brown specimens, the only one of true *H. lorea* I have seen is at Kew, and was collected by Thozet at Rockhampton.

That Mueller frequently had *H. suberea* under examination cannot be doubted. In his *Second Census* (p. 120) *H. lorea* is said to occur in all the colonies except Victoria and, of course, Tasmania. Seeing that the points of difference between *H. suberea* and *H. lorea* are so numerous and so pronounced, it is indeed hard to understand how such a practised botanist came to confound them. Moreover, from the phyto-geographical point of view the conspecificity of *Hakea* specimens from the Queensland littoral with others from the West Australian desert is highly improbable, and indeed unprecedented.

Strictly speaking, Mr. Fitzgerald cannot have examined "typical" *H. lorea*, though he may perhaps have seen Queensland littoral specimens agreeing well with the type. But, whether this be so or not, there cannot be a shadow of a doubt as to the specific difference between the two plants in question, and in this opinion I am supported by the testimony of botanical friends who have seen the type and desert specimens side by side.

Euphorbiaceæ.

Bertya Brownii, sp. nov. Fruticosa, ramis ramulisque ascendentibus bene foliosis fulvo-stellato-tomentosis deinde pubescentibus vel puberulis, foliis brevipetiolatis oblongis utrinque obtusis planis

supra appresse stellato-puberulis subtus subfulvo-stellato-tomentosis nervis perspicue fulvo-stellatis, pedicellis gracilibus folia sæpe subæquantibus fulvo stellatis, bracteis fll. masc. 4–5 verticillatis vel subverticillatis calyci approximatis bracteis fll. fem. 3–5 sparsioribus omnibus linearibus vel lineari-oblongis obtusis fulvo-stellatis diuscule persistentibus, floribus in axillis superioribus solitariis rarissime binis, sepalis extus puberulis, ovario stellatim puberulo, styli ramis tripartitis.

Hab. Australia; *R. Brown.*

Ramuli prolixi, 0·1–0·2 cm. diam. Folia plerumque 2·5–3·0 × 1·0–1·2 cm., accedunt pauca juvenilia circa 1·5 × 0·6 cm., fac. sup. fusco-brunnea; costæ secundariæ utrinque 4–7, ascendenti-patentes, rectæ, pag. sup. impressæ, pag. inf. prominentes; petioli 0·2 cm. long. Pedicelli profecto evoluti sæpissime 1·8–2·2 cm., ascendentes. Bracteæ adusque 0·5 cm. long. Fll. masc. sepala oblongo-ovata, obtusa, 0·45 × 0·3 cm.; fll. fem. lineari-lanceolata, obtusa, 0·25 cm. long. Androecium 0·35 cm. diam. Antheræ patentes. Ovarium ovoideum, compressiusculum, 0·2 cm. long. Stylus basi villosulus, ejus ramorum limbi 0·2–0·25 cm. long. Fructus non vidi.

A very distinct species, known by the tawny clothing, the long slender pedicels, the relatively long linear persistent bracts, &c.

Robert Brown has left no notes of this plant, neither is the locality specified. The Queensland coast region is the probable habitat.

Bertya dimerostigma F. Muell. in Wing's South. Sc. Rec. ii. 98.

A specimen with male flowers, I believe the only one in this country, collected by Mr. A. C. Webster at Coolgardie, is in the British Museum. As no description of the male flower has been published, one is given herewith:—Flores masculi ramulos perbreves foliatos terminantes, humectati circa 0·8 cm. diam. Perianthii lobi oblongo-ovati, obtuse acuti, sursum mox revoluti, vivi verisimiliter punicei, 0·4 cm. long., 0·26 cm. lat. Androecium 0·5 cm. long., vix totidem diam. Antherarum loculi 0·1 cm. long.

Phyllanthus (§ Paraphyllanthus) **cuscutæflorus**, sp. nov. Verisimiliter fruticosus, glaber, ramulis ultimis gracilibus bene foliosis, foliis pro rata mediocribus ovato-lanceolatis apice acutis vel breviuscule acuminatis basi cuneatis petiolis brevibus fultis, stipulis parvulis fugaceis, floribus masc. in axillis pluribus e rhachi pulviniformi perbrevi oriundis, pedicellis longissimis necnon tenuissimis, perianthii lobis 6 ovatis vel ovato-oblongis obtusis, glandulis 3 prominentibus, staminibus 3, filamentis in columnam gracilem connatis, antheris basi connatis loculis parallelis longitudinaliter dehiscentibus, floribus fem. ——.

Hab. Queensland, Myola and Barron River; *G. Podenzana.*

Folia 4·0–7·0 cm. long., 1·7–2·5 cm. lat., in sicco olivacea subtus decoloria; costæ secundariæ utrinque 5, sat distantes, interjectis pluribus tertii ordinis cito anfractuosis; costulæ aperte reticulatæ, utrobique aliquanto eminentes; petioli 0·2 cm. long. Pulvini florigeri 0·15–0·2 cm. diam. Pedicelli 1 cm. longit. leviter excedentes, sub flore paullo dilatati. Perianthii phylla humectata

± 0·15 cm. long. Glandulæ 0·04 cm. diam., rugulosæ. Andrœcium totum ægre 0·1 cm. long.; antheræ 0·03 cm. long.

A remarkable plant, which I have no hesitation in describing, although female flowers are absent. The trivial name is given on account of the resemblance to a *Cuscuta* borne by the male inflorescences.

Nepenthandra.

Euphorbiacearum e tribu *Crotonearum*, genus novum.

Flores monoici. Fl. masc.—Sepala 5, membranacea, æstivatione imbricata. Petala 5, sepalis similia nisi majora. Disci glandulæ 5, crassiusculæ, petalis alternæ. Stamina 3; filamenta in columnam gracilem connata; antheræ ad apicem columnæ sessiles, loculis erectis coalitis extrorsum longitudinaliter dehiscentibus. Ovarii rudimentum 0. Fl. fem.—Sepala 5, ampla, imbricata, paullo post anthesin aucta. Discus lobatus. Ovarium 3-loculare; styli breviter connati, 2-partiti; ovula in loculis solitaria. Capsula calyce accrescente circumdata, valvis crustaceis dehiscens. Semina ovata, compressa, ecarunculata.—Arbor? Frutex? Folia alterna, summa approximata, tenuiter coriacea. Flores in paniculis racemosis ramulos ultimos terminantibus digesti, bracteati, masculi numerosi, subumbellati, breviter pedicellati, femineus ad apicem ramulorum unicus, pedicello quam is masculorum longiori post anthesin elongato suffultus.

N. lanceolata, sp. unica. (Plate 471, figs. 7–13.) Novellis pubescentibus mox glabris, foliis breviter petiolatis lanceolatis apicem versus attenuatis utrinque obtusis integris glabris, paniculis quam folia brevioribus appresse puberulis, bracteis fl. masc. pedicellis longioribus lineari-lanceolatis membranaceis dehiscentibus, fl. masc. sepalis obovatis obtusis vel obtusissimis extus griseopubescentibus, petalis late obovatis obtusissimis, glandulis oblongis quam petala multo minoribus, andrœcio subincluso, sepalis fl. fem. lanceolato-oblongis obtusis margine undulatis vel rare necnon brevissime denticulatis puberulis, ovario tomentoso, styli ramis crassis, capsula subglobosa minute pubescens.

Hab. Tenasserim, slopes of Mooleyit; *Col. Beddome.*

Folia ± 10·0 cm. long., 2·0–4·0 cm. lat.; costæ secundariæ utrinque circa 10, interdum oppositæ vel subopppositæ, paullulum eminentes; petioli modice 0·5 cm. long., supra canaliculati. Paniculæ ± 5·0 cm. long. Bracteæ adusque 0·4 cm. long., sæpe vero breviores. Fl. masc. pedicelli 1·5–2·0 cm. long.; sepala 0·2 × 0·15 cm.; petala 0·25 × 0·2 cm.; glandulæ 0·04 cm. long.; columna staminea vix 0·1 cm. alt.; antheræ 0·075 cm. long. Fl. fem. pedicelli crassiusculi, circa 0·4 cm. tandem 1·5–2·0 cm. long., sepala mox 0·7 cm. long., et 0·25 cm. lat., in sicco fusca; ovarium fere 0·2 cm. diam. Styli rami 0·1 cm. long. Sepala fructus circumdantia 2·0 × 1·2 cm., verisimiliter colorata (anne punicea?). Capsula circa 1·2 cm. diam. Semina 0·7 cm. diam.

The genus here proposed is evidently allied to *Trigonostemon*, on the one hand, and to *Blachia* and its neighbours on the other. The male flowers are almost identical with those of the first-named,

which, however, has different female flowers, the calyx not being accrescent. *Blachia* and *Dimorphocalyx* have a similar accrescent calyx, but in each case the male flowers are quite different; those of *Blachia* being 10–20-androus, with free filaments inserted on a convex receptacle; while *Dimorphocalyx*, which the plant above described a good deal resembles in leaf and inflorescence, has a cupular calyx to its male flowers, and 10–20 stamens, of which the outermost at least possess free filaments.

Description of Plate 471.

(Figs. 1 and 7*a*, nat. size; the rest more or less magnified.)

Figs. 1–6. *Cratystylis conocephala*.—1. View of upper part of a flowering and fruiting specimen. 2. A flowering head slightly enlarged. 3. A floret. 4. Two of the free anthers, very shortly appendaged at base. 5. A style with its two flattened unappendaged arms: this shows the anthers in their natural position, *viz.* separated from each other and applied to the swollen style. 6. Achene and pappus.

Figs. 7–13. *Nepenthandra lanceolata*. — 7*a*. The plant at time of flowering. 7*b*. A female flower of which the perianth-segments have already become enlarged. 8. A male flower. 9. Male flower opened. 10. The gynæcium. 11. The same opened, showing the solitary ovule. 12. View of the capsule enclosed in the accrescent calyx. 13. A seed.

NOTES ON MYCETOZOA.

By A. and G. Lister.

Chondrioderma ochraceum Schroet. and Lepidoderma tigrinum Rost. In Sept. 1904, we visited the wooded ravine on the property of Dr. and Mrs. J. R. Bradford, at Llan-y-Mawddwy, N. Wales, where in 1900 and 1902 we had collected the ochraceous sporangia possessing many of the characters of a *Chondrioderma*, which we described and figured in this Journal for 1901 (p. 88, t. 419, fig. 3) as probably a form of *Lepidoderma tigrinum* Rost. During our ten days' stay we had a favourable opportunity for observing the development of the species in question from plasmodium to ripe fruit. There had been heavy rain before our arrival, followed by a succession of fine days, and on our first visit to the glen the lemon-yellow plasmodium was seen in abundance, spreading in veins over cushions of liverwort, *Dicranum*, and other mosses; every succeeding day disclosed freshly matured sporangia in curved ochraceous plasmodiocarps, often forming rings round the moss-leaves; they contained the purple-grey spores and profuse purple capillitium previously described. Although Prof. Farlow had twice found this *Chondrioderma* form associated with *Lepidoderma tigrinum* in the United States, we had failed to discover any trace of normal *L. tigrinum* on our former visits to Wales; on the present occasion, however, during the last week of our stay it appeared in some abundance. The stalked sporangia beset with the usual crystalline discs arose from orange-yellow plasmodium on Sphagnum, *Dicranum*

majus, and liverworts, in twelve or more situations twenty to fifty yards apart, and often closely associated with the *Chondrioderma*. Much of the orange-yellow plasmodium that gave promise of good development seemed on the following day to have been injured by exposure, and failed to produce fruit; fresh sporangia, however, appeared each day until October 3rd, when we left the district; they were mostly hidden among the moss and difficult to detect, and the numbers collected did not exceed one hundred, while those of the *Chondrioderma* may have reached a thousand. We met with no intermediate form like that received from Dr. Sturgis (see Journ. Bot. *l. c.*), in which the characters of the two genera were exhibited in the same sporangium. Although the capillitium and spores were practically identical in the two forms, the *Lepidoderma* had always the characteristic dark orange stalk and spongy hypothallus, while the *Chondrioderma* had, as constantly, sessile sporangia, with no apparent hypothallus; the difference in the colour of the plasmodium was easily recognized when the veins of each form approached so as almost to be in contact on the same cushion of moss, the lemon-yellow of the one contrasting with the orange-yellow of the other; this difference in colour is not in favour of the view expressed in our former paper, that the *Chondrioderma* is a form of *Lepidoderma tigrinum*; on the other hand, the fact of our finding the two forms together in Wales is in support of it, and we may hope that yet further light may be thrown on the question of their supposed relationship by further observation. We are, however, satisfied that the *Chondrioderma* found in Wales is the species given by Schroeter as *C. ochraceum*; with the abundant material we now possess, we are able to appreciate the accuracy of his description as applying to our gatherings.

Chondrioderma lucidum Cooke (*Diderma lucidum* Berk. & Br.). We obtained this species in greater abundance on our visit to Llan-y-Mawddwy in Sept. 1904 than on either of the previous occasions in 1900 and 1902. It had been observed by Mrs. Bradford in ripe fruit and in orange-yellow plasmodium before our arrival, and we collected upwards of one thousand sporangia on moss and liverwort scattered at intervals for more than a hundred yards up the rocky ravine in which we first collected it. The coarse but scanty capillitium noticed in the type-specimen at the British Museum, gathered at Trefriw by Broome in 1861, and which from its exceptional character suggested an abnormal development, is constant in all our specimens and in that collected by Mr. Burrell near Dolgelly in 1903 (see Journ. Bot. 1904, 133).

Badhamia rubiginosa Rost. var. globosa. We have been favoured by Mr. H. N. Dixon with a specimen of this well-marked variety; it was gathered by Mr. W. Ingham at Arncliffe, Yorks, in Sept. 1901, where the sporangia were in profusion on Sphagnum on dripping rocks; there is an almost entire absence of lime in the capillitium and sporangium-walls, and in all respects, including the strongly reticulated spores, it resembles our gatherings in Wales (see Journ. Bot. 1904, 133), where we obtained it again in

considerable quantity in Sept. 1904. In examining these gatherings we have repeatedly been struck with the resemblance they bear to the unsatisfactory type-specimen from New Zealand in the Kew Collection, named by Berkeley *Diderma Hookeri* in 1855, and placed as *Chondrioderma Hookeri* in the British Museum Catalogue, Pl. XXXV.A. The sporangia in this specimen are studded over the leaves of a species of *Hymenophyllum*, and were evidently much weathered at the time of collection; they are broken, and appear to have been subjected to rain, which has washed away the greater part of the capillitium and spores. Comparing this specimen with the *Badhamia*, we find a similar dark purple-brown stalk and prominent dark columella, and the lower part of the sporangium-wall (which is all that remains in the New Zealand example) is of the same structure and purple-brown colour; what is left of capillitium in the Kew specimen is too scanty and mixed with hyphæ of mould to allow a clear opinion to be formed regarding it, but the bases of the threads springing from the columella bear a strong resemblance to those on the columella of *B. rubiginosa* var. *globosa* in the same condition; in the limeless condition of that variety the basal threads of the capillitium are often extremely slender. Both of the British species of *Hymenophyllum* were growing in close proximity to the Welsh gatherings, so that we may conclude that the surroundings of the latter were not unlike those in New Zealand. The important difference between the two specimens rests in the sculpture of the spores; those of our *Badhamia* are coarsely reticulated, while those of *Diderma Hookeri* are simply warted; were it not for this difference, we should have little doubt that they were the same species. The type-specimen of *B. rubiginosa* in the Strassburg collection has spinulose spores, and all the examples we have received from America have the same character; the form we have hitherto met with in this country is var. *β dictyospora* with reticulated spores, but both here and in the American specimens we find variation in the sculpture, and it would appear that this feature should not be taken as constituting a specific distinction; the variety *globosa*, however, with its robust habit and globose sporangia has hitherto shown strongly reticulated spores, and until we obtain a similar form with spore sculpture connecting it with *Diderma Hookeri* the specific identity must remain an open question.

Badhamia populina Lister. In October, 1904, we were informed by Mr. Petch that this species had appeared on felled poplar trees in Wanstead Park, about a mile distant from the spot where it was discovered in 1902 (see Journ. Bot. 1904, 129). We visited the new station, and found the *Badhamia* distributed in large clusters about ten feet apart on the bark of two logs; the sporangia were in different stages of development—some were old and weather-worn, others in perfect condition or rising from white plasmodium.

Among specimens of Mycetozoa recently sent us by M. P. Hariot, of the Natural History Museum of Paris, was one of *B. populina* which he had gathered on white bark, probably poplar, at Châlons-sur-Marne, in October, 1904; the sporangia were much broken, but

quite characteristic; the dark spores traversed by a projecting ridge were precisely similar to those of our English gatherings. M. Hariot has kindly divided his specimen with us; it is the only record of the species out of this country that we know of.

Badhamia panicea Rost. Although this is properly described as a sessile species, there are sometimes exceptions to the rule; the sporangia are often seated on a scanty dull red hypothallus, the rufous colour extending into the lower part of the sporangium-wall; on several occasions we have found the hypothallus produced into a short cylindrical stalk about 0·5 mm. long. When—as not unfrequently happens—hyaline threads are present in the capillitium, there is a close resemblance between such stipitate sporangia and nearly sessile forms of *Physarum calidris*, in which species the character of the capillitium varies widely; in some specimens it is charged with lime throughout, as in typical *Badhamia*, though usually the hyaline element greatly preponderates; in all cases, however, in which a difficulty has presented itself we have found that the hyaline threads of *B. panicea* are terete, and those of *P. calidris* have flattened expansions. These species, with others that might be mentioned, indicate the indefinite boundary that separates the genus *Badhamia* from *Physarum*, though the expediency of maintaining the two genera cannot be questioned. We have recently received from Dr. Sturgis a specimen of *B. panicea* gathered by Mr. Bragg in Colorado, in which some of the sporangia have very short red stalks. This is the first example of the species we have seen from America.

Badhamia nitens Berk. We have received two interesting gatherings of this species, showing variation in the amount of lime deposits. One was found by Miss Dent on dead wood near Churt, Surrey, in the winter of 1903–4; many of the sporangia are brick-red; in these the walls are densely charged with lime in rufous patches, with pale intervening spaces; other sporangia are almost without lime, and dark yellowish grey in colour; the capillitium is dark reddish orange. The second specimen was gathered by Mr. Saunders at Chiltern Green in 1905; here the sporangia are almost black from the absence of lime in the upper parts of the walls; the bases are yellow with calcareous deposits; many of the broad strands of capillitium are nearly colourless, or chrome-yellow with scattered clusters of orange-yellow granules; the spores in both specimens are in the usual compact clusters of about twenty, and are spinose on the side turned outwards. The dark leaden-coloured sporangia from Chiltern Green are much like those of Berkeley's type from Dr. Badham, and are in striking contrast with the fine golden-yellow gatherings that Mr. Saunders made at Pepperstock in former years; he has searched the neighbourhood diligently, but has failed to discover the species there since 1897.

Fuligo ochracea Peck. The occurrence of this species in Wales was recorded in this Journal for 1901, p. 84; a second British specimen was obtained by Mrs. Montague on Nov. 8 of the same year; she found it on dead bracken in the Horner Valley, Porlock,

Somerset; it was sent to Mr. Saunders for identification, who obligingly forwarded it to us. It resembles the Welsh gathering in every respect except that the numerous wide-angled lime-knots of the capillitium are more ochraceous and less orange in colour, and thus correspond with our American specimens.

LAMPRODERMA PHYSAROIDES Rost. We have been accustomed to associate this species with fir woods; but in the romantic gorge at Llan-y-Mawddwy, before referred to, it grows in profusion on the wet perpendicular slaty rocks facing the north. During ten days spent in the district in September, 1904, we found it each day in mature fruit or arising from colourless plasmodium on the moss that covered the rocks, and extending in scattered clusters for several hundred yards up the ravine, far from any coniferous wood; the sporangia were mostly spherical, and the capillitium was, as a rule, weak and colourless or pale purplish, though not unfrequently we came upon groups with the more rigid purple-brown character of the type; the spores were of the normal size and colour in all the gatherings. We learn from Mrs. Bradford's observations in this locality during some years that the growth is capricious in the times of its appearing; for a short period it is in great abundance over a large area, and then disappears for months together; in our previous autumn visits we met with none in perfect condition, though the mouldy remains told of its having been plentiful a short time before.

ECHINOSTELIUM MINUTUM De Bary. This minute species appeared in October, 1904, on a dead herbaceous stalk (apparently burdock) brought by Miss A. L. Smith from Annan, Dumfriesshire. Some days previously she had placed the stalk in a moist cultivating chamber at her house in London. On discovering the mucor-like growth she at once recognized it as the same species as that collected by her near Hereford in 1902, which was reported in this Journal as the first recorded British gathering of *Echinostelium*; she kindly forwarded the specimen to us. At 3.20 on the afternoon of the day of its arrival, a sporangium containing about eighty spores was placed in a hanging drop, when many of the spores immediately flowed out into the surrounding water. At 3.43 two vacuoles were observed in some of the spores, and in both of these a contracting movement could be discerned with a change of position. At 4.10 a spore-wall had ruptured and the amœboid contents emerged, the rupture taking place in the thinner portion of the unequally thickened wall; on the release of the swarm-cell the spore-wall closed elastically. At 4.24 flagellate swarm-cells were in active dancing movement, the nucleus showing as usual at the base of the flagellum; others had assumed a linear form, and crept rapidly with the snail-like movement often seen in other species of Mycetozoa on the surface of the glass, the flagellum being extended in advance. At 4.40 every spore had hatched. At 5 p.m. four swarm-cells began to show constriction, and at 5.6 the two halves had separated. At 5.35 several daughter swarm-cells had produced a flagellum, though the greater number retained the amœboid movement acquired after

division had taken place. At 8.45 active dancing swarm-cells were in abundance throughout the hanging drop. Our observations here came to an end, and no fusion to form a plasmodium was detected; with such limited material no preparation to show the karyokinetic division of the nuclei was practicable, but the rapid process of development in the earlier stages of this almost microscopic species appears to be worthy of record.

Trichia verrucosa Berk. In September, 1904, we found this species with sporangia clustered on common membranous stalks, growing on a rotten larch-stump in the ravine in N. Wales, close to where it had been collected by Mrs. Bradford in January, 1899 (see Journ. Bot. 1899, 151). This is the third British record we are acquainted with; it is the species that abounds in New Zealand, as described by Miss Hibbert-Ware in the account of the Mycetozoa of that country published in the April number of this Journal.

Bedfordshire Mycetozoa.

During the past summer Mr. James Saunders, of Luton, has kept the straw-stacks on the chalk downs of S. Bedfordshire under observation, that he might see if the species that were abundant there on previous years were again making their appearance. Amongst the many rick-yards he visited he found those standing on the chalk-marl most repaying his search, for there the soil retained moisture, and the heaps of old straw left by the less careful farmers about their stacks had become sodden, and afforded abundant nutriment for plasmodium; the season proved a favourable one for Mycetozoa, but gave different results from those of any year since 1897, when he first discovered that straw was an exceptionally suitable feeding-ground for many species of the group. *Physarum didermoides* Rost. var. *lividum*, *P. calidris* List., *P. vernum* Somm., *Didymium effusum* Link, *D. difforme* Duby, and *D. nigripes* Fr. var. *xanthopus* were as frequent as ever. *Physarum straminipes* List. and *Didymium Trochus* List., species first found by Mr. Saunders in the neighbourhood of Luton, have appeared there regularly and often in countless profusion for six years, from 1897 until 1902, but have not been found there since. *Badhamia orispora* Racib. was obtained in the same years, omitting 1900, and again in Aug. 1904, when the characteristic minute sporangia appeared in greater abundance than ever on straw at Stopsley Common and Chaul End.

Perhaps the most striking feature of last season's gatherings on the straw-heaps was the great development of *Fuligo ellipsospora* List. Mr. Saunders had gathered this species in small quantity in South Beds in 1899 and 1903. On August 1, last year, he found it in great abundance at Stopsley Common, and again a week later near a straw-stack at Chaul End, on the high open land above Luton. At his suggestion we visited the place in his company. The ground about the stack was strewn with loose straw and a thick layer of the husks of threshed wheat, through which grass and docks

had pushed up. On this the snow-white æthalia of the *Fuligo* had formed in such profusion that they could be seen for some distance away, and at first sight suggested the idea that whitewash had been freely sprinkled about. The largest æthalia were 5 cm. long, the smallest about 2 mm.; where they had matured on grass the blades were bent down by their burden. The smooth cortex was very fragile, and would shake off at a touch in large flakes, exposing the purple-black mass of spores beneath. Æthalia that had been kept moist by overlying herbage had developed no continuous cortex, and clearly exhibited the outlines of the component sporangia. Microscopic examination of the specimen showed the capillitium to consist of a network of hyaline threads, with many lime-knots often combined to form a pseudocolumella; the spores are purple and more or less ellipsoid, measuring 13–15 × 11–14 μ.

Spumaria alba DC. was also abundant last August at Chaul End; we found about twenty large æthalia had matured round the base of a stack of clover and on loose straw amongst which the cream-white plasmodium was still creeping. The spores in different æthalia show much variety both in colour and marking. In some they are of the usual type, purplish grey, and strongly spinulose. In others the spores exactly resemble those of the form found by Mr. R. E. Fries in Bolivia in 1902, and described by him in *Arkiv für Botanik*, 1903, Bd. i. 66, under the name of *Spumaria alba* var. *dictyospora*; they are rich dark brown, nearly black, and marked with a close reticulation of raised bands. Intermediate forms were found in other æthalia connecting the extremes. It is satisfactory that this variety is now recognized as occurring in Britain, and that its close relation to the type is completely established.

SOWERBY'S DRAWINGS OF FUNGI.

By Worthington G. Smith, F.L.S.

The British Museum is fortunate in the possession of nearly all the original drawings—some in duplicate—made by James Sowerby for his *English Fungi*. Amongst the drawings are numerous original supplementary sketches which do not appear on the published plates; these, with the pencil notes, are often of great service for the identification of the plants drawn.

The Museum also possesses proof plates, undoubtedly coloured by Sowerby himself, as guides to the print-colourers. In some instances the proof plates bear a number different from the plates in the volumes; the old number has in the latter cases been hammered out of the plates, and a new number engraved before publication. In some cases there are proof plates both coloured and uncoloured, or coloured in duplicate, both before and after lettering. The proof impressions sometimes bear additional notes from Sowerby's pencil as to colour, odour, taste, &c. These notes sometimes clearly show

that Fries's identifications—made from the plates as published in the volumes—are erroneous.

In the Museum collection are numerous other drawings by Sowerby of great interest—intended for publication—but which up to the present time have never been published. The drawings are quite worthy of publication in a volume by themselves.

As works of art Sowerby's drawings are greatly superior to the plates; but one or more inferior artists obviously assisted Sowerby. The crude inferior drawings are easily distinguished from Sowerby's really good work. Sowerby was often very careless in copying his own originals; in fact, in some instances the copies hardly bear any real resemblance to the originals either in size or colour. One very fine drawing undoubtedly represents *Boletus regius* Kromb., a magnificent species, only of late years recognized as British. Now Sowerby's plate of his fine drawing is so altered both in size and colour that Fries referred the plate to *B. edulis* Bull., a totally different plant.

Sowerby had an objectionable habit of altering the size of his drawings to suit the sizes of the copper plates which he happened to have in hand; so that when his stock of plates ran to small sizes he would reduce his original drawing to suit his plates, and, if the plates were large, he would spread out the size of smaller species of fungi. He widened, narrowed, elongated, or shortened some species according to the accidental length or width of the plates he had in stock at the time of engraving.

In one instance the descriptions of two very important plates are transposed. The names of persons, dates, and localities are often omitted in the letterpress, though present on the original drawings. The date is often of consequence when given, as by the date certain vernal and autumnal species can be distinguished at once.

Many of Fries's queries are completely answered by reference to the unpublished notes on the drawings. It seems strange that Berkeley—who had both the original drawings and proof plates in his possession for many years—made so little use of the information and critical notes. During the fourteen years that the drawings of British Basidiomycetes have been in hand, all Sowerby's drawings, plates, and notes have been carefully examined.

The following notes do not pretend to be exhaustive, as some are too trivial for transcription—as "Mr. —— brought this," "Mr. —— also found it," "I found it again at ——." Most of Sowerby's localities are of but little service. They are usually near London—as Battersea, Hackney, Clapham, Hornsey Wood (now Finsbury Park), &c. Most of the localities have indeed been built over. Sowerby frequently gives the odour and taste of the species he illustrates; and he not only cooked and ate a considerable number of species, but tasted them in a raw state.

When plates are not mentioned in these notes, it is because the figures represent microscopic fungi, or because the original and plate are sufficiently alike to need no comment, and there may be no written notes.

1. Agaricus (Volvaria) volvaceus Bull. The plate appears to be made up; the taller figure on the plate is not on the original drawing; the section of the egg state on the plate is twice the size of the original, and there is a section through the gills and stem on the original drawing which is omitted from the plate. In Sowerby's model of this species he has introduced a well-developed annulus on the stem, a character foreign to *Volvaria*; but it must not be considered impossible for a ring to occur, as rings now and again appear on the stems of normally ringless species. On the back of this drawing there is a sketch of one of the Mycetozoa—*Arcyria punicea* P. Sowerby gives the name as *Clathrus denudatus*. A drawing of *A. volvaceus* is in the Dickson-Sowerby collection, but only the two figures on the right of plate are reproduced. Five other figures and two sections are not engraved, and the two large plants and the section on the plate are not on the drawing.

2. Agaricus (Lepiota) cepæstipes Sow. There is an original of the group of white plants belonging to this plate in the Dickson-Sowerby collection, but the individuals have been regrouped. There are two sections on the plate, large and small, but only the larger is on the original drawing. Sowerby's drawing is considerably worked over with body-white, which to this day has remained perfectly snow-white; this is very strange, as a permanent body-white water-colour was unknown in Sowerby's time. Flake-white was in common use, and all old examples of work with this colour have now become lead-colour or almost black. Sowerby must have got at some permanent white, perhaps only known to himself.

7. Gomphidius glutinosus Fr. The original of this is without notes.

9. Cortinarius (Myxacium) elatior Fr. There is a good, carefully-coloured section on the original, omitted on the plate. Near the stem is written, "partly pithy."

10. Agaricus (Clitocybe) fragrans Sow. There is an additional figure on the original drawing, and the grass on the plate is an addition. The following note is written on the drawing:—"Pileus when fresh stellated* or transparent, showing the gills, but light when dry and more a stone color. Pleasant odour of a peach kernel; tast similar, but more watery." On the back of the drawing is: "So fragrant I found it by the scent on Highgate common, it even overpowerd all the other funguss in a box full; the next day found one in company with Mr. Woodward, which, when brought to his house in the box was so powerful as to overcome the scent of all the others, tho' the box was large and full."

14. Agaricus (Lepiota) clypeolarius Bull. The original of this is in the Dickson-Sowerby collection, but with two additional figures of a small example showing the umbonate pileus. The annulus shown on one small example and on the section are not on the original drawing. The original section only shows the gills

* This refers to the striæ at the margin of the pileus.

on the right of the stem, and the latter is not continued to the base as on the plate.

15. Hydnum ochraceum Pers. The original is an uncoloured pencil sketch named *Hydnum Daviesii*. It bears the following note: "Found on a decaying apple tree in Llysdulas Garden, Anglesea, 1790, by H. Davies."

20. Hygrophorus ceraceus Fr. The following is written on the original drawing:—"Transparent as wax—tast camp^{s}. [*campestris*] like, but rather watry."

21. Marasmius fœtidus Fr. The section on the original drawing is one quarter less in diameter. On the proof plate is written in reference to the pileus, "redder," and to the stem, "blacker."

25–27. Hymenochæte tabacina Lev. **H. rubiginosa** Lev. **Stereum hirsutum** Fr. No originals.

31. Agaricus (Tricholoma) rutilans Schæff. There is an additional outline of a small example on the original drawing, and a second unpublished coloured drawing of small examples on which is written, "*Xerampelinus*, no doubt."

32. Hygrophorus virgineus Fr. This plate is made up from two drawings—one large, the other small; on the larger three examples are slightly tinted, and a note added, "sodden with wet." There is no original for the smallest figure on plate. There are five drawings in all, with thirty figures.

33. Agaricus (Galera) tener Schæff. There are two drawings of this—one a single example, the other with nine specimens. There is an outline of an expanded plant on the original plate.

34. Boletus piperatus Bull. On the original drawing the reverse side of the group of two on the plate is illustrated as an addition, with the note, "tast acrid, biting the tongue and throat."

35. Spathularia flavida Pers. The original is in the Dickson-Sowerby collection, and is named "Clavaria spathula 'Dix$^{n.}$,' see Fas$^{a.}$" The original examples are about 1 in. deeper, two specimens are omitted on the plate, and the prostrate half on the plate is an addition. There is a section on the original, but different from the plate.

36. Russula nigricans Fr. The pileus of the original is $1\frac{3}{8}$ in. more in diameter, and $1\frac{3}{4}$ in. more in height; the half-section in original is $1\frac{1}{2}$ in. more in diameter, and $\frac{5}{8}$ in. more in height. The black colour on the plate is not on the original. The change of colour in the flesh from white to red is clearly shown on the original in one half of the section of the stem, with the note, "Spongy changes red in a minit." This colour is omitted in proof plate, but part of the gills are coloured reddish in the published plate. The pale olive-colour of gills in plate is not on the original drawing. The following notes are added: "firm nut tast"; and "changes to quite black then putrifies, or drops to pieces."

37. Marasmius peronatus Fr. This plate is made up from two drawings out of four. The first drawing contains two illustra-

tions of a large example, one of which is inverted; neither is engraved. The specimens engraved are altered in size, the original being ¼ in. more in diameter, and ⅞ in. taller. The section is from another drawing, and altered both in height and diameter. On one drawing the figures on the right and left of the plate occur with two other figures. On this drawing is written, "tast biting." On a third drawing is written, "Bastard champignon. Supplement."

40. Calocera cornea Fr. The original is an uncoloured pencil sketch with a small enlarged group below—the latter is not engraved.

41. Agaricus (Hypholoma) velutinus Fr. In the original the pileus is the only part coloured, and this is much paler than the plate; the broad margin of the pileus is white. The two small examples on right and left of plate are not on the original. There is a second and more important drawing unengraved; it contains a group of six examples, and a good section. Both are named "lacrymabunds" by Sowerby, and he adds, "smell and tast insipid or not sensible."

42. Agaricus (Clitocybe) odorus Bull. This is made up from two drawings; the section on the plate is from one, and the views from the other; there remain one view and one section unengraved. On the back of one drawing is a note, "smell like ratarfee," and on the other, "tast not unpleasant" and "smells of rattoffe."

43. Cortinarius (Dermocybe) sanguineus Fr. This is modified from a coloured original; the chief figure on the plate has a pileus ⅜ in. larger than the original; the latter agrees with a pencil outline on the drawing.

44. Agaricus (Tricholoma) sulphureus Bull. This is taken from two out of three drawings; on one is written, "Gills rather irregular—fœtid Hyacinth smell tast disagreeable, fœtid; does not change color even in 12 hours." On another sheet is, "Tastlass almost."

45. Agaricus (Omphalia) fibula Bull. There are only six figures on the original; of these, two only are coloured. There are twenty-two specimens shown on the plate.

(To be continued.)

BOTANICAL COLLECTING.

At the meeting of the Linnean Society on 19th January, Dr. Augustine Henry gave a suggestive and interesting discourse on Botanical Collecting. The actual methods were briefly alluded to, stress being laid on truthful labelling of the specimens at the moment of collection, instead of months afterwards, when identical numbers were often given to plants of different *provenance*. With the aid of nearly fifty lantern-slides, he showed his travels in China, demon-

strating that the popular idea of that country as one vast rice-field was fallacious, as it mainly consisted of vast mountain-ranges cut up by deep valleys. In some of the slides the home of the wild forms of the Chrysanthemum, *Primula sinensis*, etc., were shown; and the lecturer alluded to the early history of horticulture in China, stating that the first botanical garden there was made 111 B.C. in Shensi, plants from subtropical regions, as the Banana, *Areca* Palm, and Orange, being introduced. Other slides showed typical forms of subtropical deciduous and evergreen trees; and the occurrence of epiphytes and lianes in vast numbers was mentioned. Dr. Henry said that the text-book statement that epiphytes of higher types than ferns do not occur in Europe is too sweeping, as in the moist warm climate of Ireland, *Cotyledon Umbilicus* in Wicklow covers the trunk and branches of the Alder, while Rhododendrons in two cases were seen by him growing on the bark of *Pinus sylvestris*; and *Pyrus Aucuparia* seems to be a true epiphyte in various parts of Scotland and Wales. Dr. Henry alluded to "mimicry" in plants, in the case of two species of *Lysimachia* (a polymorphic genus in China), one of which mimicked *Paris quadrifolia*, with 4 leaves, while the other recalled another species of *Paris* with 10–12 leaves. He referred also to the extraordinary richness of species on calcareous soils as compared with other soils, a fact constantly seen in China, and well marked also in France; and asked for some explanation. In China, as elsewhere, pure woods were rare, being only formed by a few conifers, like *Abies Fargesii* at high altitudes in Hupeh, *Cupressus funebris* in the same province at lower levels, *Pinus Massoniana* (almost everywhere in the central and southern provinces), other species of *Pinus* more local; also certain species of Oak widely distributed; and *Alnus nepalensis* in Yunnan. The explanation of the occurrence of pure forests was also a subject not completely understood: *e.g.* in this country Ash seeded freely, and in some places for a time looked as if it would grow into a pure wood; but apparently pure forests of Ash only occurred on extremely rich soil in some districts in Russia.

With regard to botanical collecting, three stages had occurred. At an early period plants were collected to be merely named and classified; in fact, they were treated like postage stamps. The second period began with Sir Joseph Hooker, who inaugurated the study of the geographical distribution of plants. The third period, that of the present day, was a step forward, in that attention should be paid to the plants themselves as social organisms, living in harmony and yet in competition together; and Dr. Henry urged that the time had come when the hunt for new species should cease to be the sole aim of the collector, and the study of the known species be taken in hand in their living conditions. He advocated map-making of small areas, census-taking, measurements, records of natural seedlings, soil, shade, etc., etc.; and to illustrate this plan showed a series of slides taken in France, the idea of which was to explain how the commoner species of trees behaved at different altitudes and on different soils. These slides included Beech, Spruce, *Pinus Cembra*, *P. montana* (which, according to Dr.

Henry, often attains 80 ft. in height and thrives on peat-mosses and on rocky soil, so thick with boulders that practically no vegetation existed except this hardy Pine), Larch, *Quercus sessiliflora*, and *Q. pedunculata*. He pointed out that these two species differed as to soil and situation, and complained that their areas had never been mapped out in England. The causes favouring the existence of the two very different forms of the common Birch were unknown, yet in Scotland this problem could easily be attacked. The systematic botanists had only asked from collectors specimens with leaves, flowers, and fruit: material to be named and classified. Yet in trees and shrubs the winter stages were of extreme interest, also the seedling stage. Elm seedlings and seedlings showing the difference between the two common Oaks were not to be found in the National Herbaria, and are not described in books. Dr. Henry also referred to the small amount of work that had been done in regard to peat-mosses, and the great importance of studying the ancient forests, of which these mosses were—to put it broadly—the ruins. He mentioned extraordinary growth of trees in deep peat-mosses of the present day, as Alder averaging 95 ft.; even the Oak also occurred. Owing to the small amount of attention that had been paid to scientific forestry in this country, trees had met with scanty recognition from the authors of local floras; and in some cases species (as the *Arbutus*) were put down as shrubs, though there was plain evidence that they attained the size and filled the functions of forest trees.

SHORT NOTES.

Leptosarca: a correction.—This new antarctic alga, described in the last number of the Journal (p. 108), was unfortunately figured in too diagrammatic a manner in tab. 470. The walls of the large internal cells are drawn three or four times too thick in fig. 11*b*, and twice too thick in fig. 11*a*. Thus one of the striking features of the genus—namely, the extreme tenuity of these walls—is not made evident. The walls are in reality only about 2 μ thick, except at the edge of the frond (fig. 11*a*), where they measure 8–10 μ. They are in fact so thin that, when the thallus is dried under pressure, the inner cells are quite crushed and indistinguishable, and cannot be made to swell out again, and the thallus is reduced to one-quarter of its normal thickness. The large cells in question have a diameter of about 200 μ, and extend across the section almost from cortex to cortex. Again, the cortical layer is wrongly represented; it is in reality monostromatic, save at the edge of the thallus, where the cells form two or three rows. The cortical cells measure 12–15 μ long by 6–10 μ thick. Finally, the subcortical cells are represented as empty, though really they have a thin protoplasmic lining with plastids.—A. & E. S. Gepp.

Galeopsis Ladanum L. (p. 129).—The plant which I mean from Glamorgan (whence it has long been recorded) is *G. angustifolia*

Ehrh. I ought to have said so at the time, as my quotation of the *Alien Flora* name was given in inverted commas. — H. J. Riddelsdell.

The record for West Lancashire given by Mr. Wheldon and myself was taken from the *Flora of Preston and Neighbourhood*. Not having seen a specimen of the plant from the locality there given, we are unable to state whether it is referable to *G. intermedia* or to *G. angustifolia*, but presumably the latter. Mr. J. Beanland, of Bradford, has just favoured me with a specimen of *G. angustifolia* Ehrh. from the sea-coast shingle of Bare, near Morecambe, in the same vice-county, gathered in 1895.—A. Wilson.

Gagea fascicularis in Herefordshire.—When Mr. R. F. Towndrow reported (Journ. Bot. 1900, 229) the occurrence of this plant from a small coppice near Leigh Sinton, Worcestershire, I formed the opinion that it was highly probable that it would be found higher up on the brook that traverses this coppice. On the 1st of April last I made a search with this end in view, and found several plants growing in a field on the borders of the same brook. The field is on the left-hand side of the road going towards Hereford, and about two hundred yards above the 'New Inn.' The plant has previously been reported for Herefordshire from Ross (District 2), and near Purlieu Lane (District 4), and this record will also apply to District 4, but is some five miles away from the other station on the west side of the Malvern Hills.—Carleton Rea.

NOTICES OF BOOKS.

Species and Varieties: their Origin by Mutation. Lectures delivered by Prof. Hugo de Vries, edited by D. T. MacDougal. Pp. 16, 847; small 4to. Price one guinea. London: Kegan Paul, Trench & Co., 1905.

It is a far cry from Lamarck to Darwin; and, so multiplex are the activities in the advancement of science, it is a still further cry from Darwin to De Vries. On so broad a basis and on so comprehensive a scale did Darwin establish his theories, that the later accretions bearing on such subjects as variability, inheritance, adaptation, selection, degeneration, and mutation, necessarily vague and ill-defined in his time, have been fitted in their places in his scheme and plan of evolution, without either obscuring or disfiguring the bold outlines and salient settings of the original. The concluding volume of Prof. De Vries's *Mutation-Theory* was published less than two years ago (in German), and was accorded a hearty welcome by biologists. The present volume is a solid contribution to the same subject, consisting of an edited series of lectures delivered last year at the University of California, on the invitation of the collegiate authorities. It discusses the subject-matter in a somewhat more condensed form, and at the same time more adapted for the use of the general reader. In both respects the famous Dutch professor

has been eminently successful. The work, as edited by Mr. D. T. MacDougal, is a concise and lucid exposition of the theory which De Vries, by original researches, patient investigation, methodical observation, and critical analysis of results obtained, has offered for the consideration of scientific workers in general and of botanists in particular.

In Biology, as as in other sciences, there seems to have been an evolutionary sequence of fundamental concepts, which have presented themselves at different times to patient observers, analogous to one another without being homogeneous. The first stage in its development is the inspiration or idea that the theory is possible. Thus it occurred to Lamarck that the origin of species was a natural phenomenon,—at that time incapable of demonstration or proof, because it was neither based on the classified observations of phenomena nor their experimental investigation. The second stage was reached by Darwin, who, after a methodical series of observations continuously accumulated, was able to assert that the origin of species was an object of inquiry. The third stage is reached in the co-ordinating and re-constructing investigations of Galton, of Karl Pearson, of Mendel, of Metschnikoff, and of the quite modern school of which Prof. De Vries is so distinguished an ornament,—that the origin of species is an object of experimental investigation. I would suggest the clear limitation of these three stages. In the first there is neither analysis nor synthesis, but only an indication of probable causation. In the second there is a critical analysis of observed facts. In the third the method of procedure is inverted, and there is a synthesis or re-construction leading up to observed facts by series of experimental investigations. Further, it has been laid down that the chief object of all experimentation is to obtain explanations of natural phenomena already observed and codified.

In the earlier part of the volume the author points out that in the origin of variations Darwin has recognized two possibilities. To quote the author himself, who tersely summarizes the statements: "One means of change lies in the sudden and spontaneous production of new forms from the old stock. The other method is the gradual accumulation of those always-present and ever-fluctuating variations which are indicated by the common assertion that no two individuals of a given race are exactly alike. The first changes are what we now call mutations, the second are designated as individual variations, or as this term is often used in another sense, as fluctuations." Darwin recognized both lines of evolution; Wallace considers the latter as the exclusive factor. The defenders of the theory of evolution as limited by Wallace are themselves divided into two camps. One group comprises the Neo-Lamarckians: "they assume a direct modifying agency of the environment, producing a corresponding and useful change in the organization." The other group are the Selectionists: they assume variable fluctuations in all directions, and leave the choice between the fluctuations to the sieve of natural selection.

The author's general statements are conveyed in the first thirty-

one pages of introductory matter. The thirty-seven lectures which follow discuss in admirable detail the subject-matter under the five heads of elementary species, retrograde varieties, ever-sporting varieties, mutations, and, lastly, fluctuations. The fourth section, as might be expected, is the longest, and comprises one-third of the book. The first mutation dealt with is that of the peloric toad-flax. This peculiar variety was first recorded by Zioberg, a pupil of Linnæus, who found it in the neighbourhood of Upsala; and the discovery was described by D. Rudberg, in his dissertation, in the year 1744. It is pointed out that ripe capsules with seeds have never been seen in the wild state. The only botanist who succeeded in sowing seeds of the peloric variety was Willdenow, and he obtained only very few seedlings.

The author plunges into the discussion on Mutation with all the enthusiasm of the neophyte. He gives the most lucid exposition of the theory which has yet been offered to philosophical biologists. Naturally he traverses the opinions of some biologists who require a considerable period of cosmic history for the evolution of diverse types, by adducing the phenomena of mutation for bridging over inconvenient gaps. He thus earmarks the researches of Lord Kelvin and other physicists, in which they endeavour to show that great limitations have to be put upon the enormous demands for time made by Lyell, Darwin, and other biologists. In the Homeric combat between the physicists and the biologists, most of the people best qualified to judge have, we believe, conceded, that for the present, at any rate, the biologists have gained the day, with the reservation of partial successes here and there to the credit of the physicists. The crucial opinion upon which the argument hinges is the period of the secular cooling of the earth. If Prof. De Vries, however, launches mutations in the same boat with cataclysmic periods, it is doubtful whether advanced biologists will follow him to the extreme limits of his argument, in spite of the ability with which he adduces his conclusions from premises apparently sound. The ultimate concepts of cosmic evolution, like the primary concepts, are drawn, not from inorganic structures, but from organic life. It is more than likely, therefore, that the last word on the subject will be said by the biologists, and not by the physicists. One is not surprised, therefore, that the author is inclined to throw cold water on the arguments of the mathematical biologists, such as Karl Pearson, Kapteyn, and Galton, although on the other side he appraises at its full value Quetelet's famous discovery of the Law of Fluctuating Variability; and, further, warns biologists "to abstain from the use of methods which are not necessary for the furtherance of experimental work."

In the section which treats of Fluctuations the author is less sympathetic. In the earlier part of the work he asserts his belief "that species and varieties have originated by mutation, and are, at present, not known to originate in any other way." This section is, therefore, a concession to the claims of those who, like Wallace, restrict within arbitrary limits the principles of evolution, limits never circumscribed by Darwin himself. He formulates, as a

salient principle, that fluctuations are linear, being limited to an increase and to a decrease of characters; and that these changes are mainly due to differences of nourishment, either of the whole or in parts.

In the final lecture the author discusses artificial and natural selection in their bearing on Fluctuations, but does not refer to the important topics of the inadequacy of natural selection and the inheritance of acquired characters, dealt with from opposing standpoints by Mr. Herbert Spencer and Prof. Weismann. The reason probably is that these matters are rather for the zoologists, while De Vries's work is almost wholly botanical.

The reviewer may venture on one little grumble, and this at the expense of the publishers, on account of the unnecessary bulkiness of the book. The margins are ample, and the print is large. On comparing the book with the last edition of Darwin's *Origin of Species*, clearly printed and agreeable to read (from a typographical point of view), we find that on p. 210 of the present work there are 228 words, while on the much smaller page of Darwin, p. 210, there are as many as 526 words, without any sacrifice of clearness. The publishers therefore might have reduced their book to less than half its bulk.

It is not possible within the brief space allotted to this review to do justice to the admirable exposition of the theory therein contained, and of the theories ancillary to it which are lightly touched upon by the author. His views are stated with consummate ability and with unusual clearness, which only serve to bring into relief certain details in which he runs counter to the general consensus of opinion of many biologists of the first rank. These will probably agree with the broader views outlined by Darwin, who recognized both lines of evolution—the gradual accumulation of variations ever fluctuating and always present, and in (what was certainly obscure and but little known from observed facts in his time) the sudden and spontaneous production of new forms from the old stock. In a final sentence the author crystallizes the results of his long studies into the statement that they strongly support the view of the origin of species by mutation instead of continuous selection. As a friendly critic of his has said: "Natural selection may explain the survival of the fittest, but it cannot explain the arrival of the fittest."

FREDERIC N. WILLIAMS.

Liste des Algues Marines observées jusqu'à ce jour entre l'embouchure de l'Escaut et la Corogne (incl. îles Anglo-Normandes). Par J. CHALON. Anvers: Buschmann. 1905. Price 6 francs.

THIS list represents the marine algal flora of Belgium, North and West France, and North Spain. The author describes the sources from which he has derived his facts and information. These comprise his own collections at some seven different localities, contributions from other collectors, the herbaria at Caen, Brussels, Antwerp, &c., the local floras and other literature, the manuscript of Van Heurck's forthcoming Prodromus of the marine flora of

North-west France and the Channel Islands, and Malard's notes on the flora of the little Norman island of Tatihou. The florule of Tatihou forms a separate list at the end of the book. The author calls attention to the rich harvest of deep-water species which may be reaped from the spiny backs of the *Maias* crabs; these, while serving as a permanent substratum for the growth of minute species, often bring up fragments of larger species from considerable depths. Similarly, lobster-pots and nets are well worth examination. The author furnishes some interesting topographical and distributional notes on the principal stations of the long line of coast dealt with in his book, and indicates islands and stretches of coast which still require exploration. The list contains 844 species and 377 forms and varieties. Some 92 species are also included as likely to be found on the French and Spanish coasts, though at present known only from the south coast of England or the Mediterranean. This comprehensive enumeration will doubtless prove very helpful to French and British students, but its value would have been vastly increased had the author included references to figures and literature.

A. & E. S. Gepp.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on April 6, Mr. W. B. Hemsley exhibited a new species, *Nepenthes Macfarlanei*, which differs from all other known species, except *N. Lowii*, in the under side of the lip being thickly beset with stiff bristles, interspersed with honey-glands. The function of the bristles in this position is not obvious: but their *rôle* would seem to be preventative to flying insects, though ants might creep among them and drink the honey. The pitchers of *N. Macfarlanei*, as probably of all other species, are of two kinds, apart from those on the young seedlings. In some, perhaps only the intermediate ones, the whole of the inner surface is covered with digestive glands and the anterior ribs are not winged. In others, the upper part of the inner surface is perfectly smooth, forming what is termed the conductive zone to the glandular or retentive zone; the anterior ribs are developed into fringed wings; and the collar has an upward elongation where the lid is attached. The honey-glands on the under side of the lip are very prominent, oval or circular in outline, surrounded by a raised rim, and from one-fiftieth to one-twelfth of an inch in diameter. The digestive glands are gradually smaller from the base upwards, and vary from about two thousand to five thousand to the square inch. These glands are many-celled, ovoid or spherical in shape, and, in consequence of the unequal growth of the tissues in which they are embedded, they are more or less over-arched, the opening of the arch looking downwards. The surface of the tissue is hard and polished, quite smooth to the finger moving in a downward direction, and rough to the finger, from the sharp edges of the arches, moving in an upward direction.

Prof. R. J. Harvey Gibson gave the substance of a paper on "The Axillary Scales of Aquatic Monocotyledons." He compared the ligule of *Selaginella* with the scales in question, and suggested that the latter may be looked upon as evidence that the Monocotyledons may be regarded as modern representatives of primitive Angiosperms, and in turn may have been genetically related to some ancestral form allied to *Isoetes*. These scales had been examined in seventeen species of *Zostera*, *Potamogeton*, *Ruppia*, *Aponogeton*, *Triglochin*, *Alisma*, *Sagittaria*, *Butomus*, *Limnocharis*, *Halophila*, *Stratiotes*, *Hydrocharis*, and *Vallisneria*. Dr. D. Prain read a note on *Mansonieæ*, a new tribe of *Sterculiaceæ*, and exhibited specimens and diagrams of a plant sent to the Calcutta Botanic Garden by Mr. F. B. Manson, of the Indian Forest Department. This was examined at Calcutta, by Mr. J. R. Drummond, and is the type of a new genus, *Mansonia*. Its nearest ally is an African genus, *Triplochiton*, which has been made the basis of a new natural order, *Triplochitonaceæ*. The peculiar characters on which its claim to ordinal rank is based are to be found in the andrœcium, which consists of a ring of free stamens inserted at the apex of a distinct gynophore, with a whorl of petaloid hypogynous staminodia between the free stamens and the free carpels. The andrœcium of *Mansonia* shares these peculiarities, but *Mansonia* differs generically from *Triplochiton* because the calyx is spathaceous, not regularly 5-lobed; the petals are sessile, not clawed; the stamens are definite, not indefinite, in number, and the staminodia are valvate, not contorted-imbricate.

Robert Tucker, M.A., Camb., Mathematical Master at the London University College School from 1865 to 1899, and Hon. Secretary of the London Mathematical Society, who was born at Walworth, Surrey, April 26th, 1832, and died on January 29th last at Worthing, where he had resided for a few years past, was much interested in botany. He did a considerable amount of field work, especially in the years 1863 to 1875. He contributed notes, chiefly on Isle of Wight plants, to this Journal in 1870–1874, and his name appears frequently in Mr. A. G. More's "Supplement to the *Flora Vectensis*," published in 1871 in this Journal, and in Mr. Townsend's *Flora of Hampshire*, published in 1883, as the authority for localities of plants. He also contributed localities of Acton and Enfield plants to the *Flora of Middlesex*. There is an interesting account of him in the *University College School Magazine* for 1899, p. 243.

The second volume of Prof. Marshall Ward's series on *Trees* (see Journ. Bot. 1904, 318) is occupied with the consideration of "Leaves" in their various aspects. It consists of two parts: the first, or "General," deals with form, composition, structure, physiology, and the like; the second, "Special," contains a "classification of trees and shrubs according to the character of the leaves." As in the previous instalment, the volume owes much of its attractiveness and value to the numerous and excellent illustrations; a capital index adds to its usefulness. The book is issued by the Cambridge University Press (4s. 6d. net), and is very well printed.

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SIX NEW SOUTH AFRICAN PLANTS.

By Spencer le M. Moore, B.Sc., F.L.S.

A small but valuable parcel of plants recently sent to the National Herbarium by Mr. J. Burtt Davy, Government Botanist, Pretoria, has yielded five of the six novelties described in the following paper. For the sixth—a *Helichrysum*—the Herbarium is indebted to Mr. E. R. Sawer, of the Rhodesian Agricultural Department.

It is to be hoped that both these gentlemen will continue the work begun under such favourable auspices. Mr. Davy especially will be able to render yeoman's service if he can resume botanizing in the districts from which his best plants come, *viz.* Swaziland, so far but little known, and the Ermelo District of the Transvaal bounding it on the west. The flora of Swaziland is an interesting combination of the floras of the Transvaal, Natal, and southern Tropical Africa, and is probably the southern limit of several tropical species, such as *Pterocarpus erinaceus*. I have added a few of the more noteworthy of Mr. Davy's plants which are not new.

Adina Galpini Oliv. in Hook. Ic. Pl. sub tab. 2386.
Along streams at Miles, Carolina District, 2907.

Cephalanthus natalensis Oliv. in Hook. Ic. Pl. sub tab. 1331.
Among kopjes at em-Babaan, Swaziland, 2779.

Pavetta disarticulata Galpin in Kew Bull. 1895, 145.
Swaziland, near Miles, 2902.

Fadogia Cienkowskii Schweinf. Rel. Kotsch. 47, var.
Em-Babaan, Swaziland, 2770.
Differs from the type by reason of its narrow leaves, smaller calyx-lobes, and corolla only puberulous outside. Possibly a distinct species.

Helichrysum (Lepicline § Plantaginea) **Davyi,** sp.nov. Herbaceum, erectum, caule simplici undulato tereti albido-tomentoso inferne folioso superne nudo, foliis radicalibus oblanceolatis vel oblanceolato-obovatis apice breviter mucronatis basin versus in petiolum longum alatum gradatim desinentibus 5–7-nervibus supra (ut videtur perpetuo) araneoso-pubescentibus subtus argenteo-tomentosis, foliis caulinis radicalibus similibus sed sessilibus et minoribus et apicem versus attenuatis et 3–5-nervibus, pedunculo elongato inferne sparsissime bracteato tomentoso, bracteis linearibus junioribus imminutis, capitulis parvis homogamis circa 20-flosculosis breviter pedunculatis in glomerulum subdensum polycephalum digestis, pedunculis propriis capitula haud æquantibus tomentosis, involucri ovoidei extus araneosi circa 4-serialis phyllis oblongis rigidis extimis quam reliqua brevioribus omnibus appendice brunnea tenuiter scariosa obtusa coronatis, receptaculi squamis elongatis crassiusculis, flosculis inclusis, antherarum caudis microscopice setaceo-ramosis, styli ramis apice truncatis, achæniis cylindricis glabris, pappi setis scabridis albis.

Hab. Transvaal, Carolina District, one mile north of Robinson's; *J. B. Davy*, 2972.

Folia radicalia (limbus) 4·0–10·0 cm. long., 1·25–2·0 cm. lat.; petiolus 2·5–5·0 cm. long., basi caulem vaginans. Folia caulina 5·0–7·0 cm. × 1·0–1·2 cm. Pedunculus fere 20·0 cm. alt. Bracteæ perpaucæ inferiores distantes, 1·0–2·0 cm. long., superiores 0·3–0·6 cm. Pedunculi proprii 0·15–0·3 cm. long. Capitula 0·4 cm. long. et diam. Involucri phylla extima 0·32 cm. × 0·05 cm., reliqua 0·4 cm. × ± 0·1 cm. Receptaculi paleæ 0·15 cm. alt. Corollæ 0·3 cm., achænia 0·06 cm., pappus 0·35 cm. long.

Flowering-heads a good deal like those of *H. allioides* Less. and its allies, but smaller, and with fewer floscules; this and the oblanceolate leaves permanently araneose-pubescent above and silvery tomentose below are the chief characters of the species.

H. mixtum O. Hoffm. in O. Kuntze, Rev. Gen. Pl. iii. 2, p. 152 (e descript.).

Swaziland, Bremersdorp, 3008. (This is also at Kew—Saddleback Mt., Barberton; *Galpin*, 1293.)

The specimens agree excellently with Dr. Hoffmann's description.

Helichrysum (Lepicline § decurrentia) **Saweri**, sp. nov. Caule ascendente copiose folioso araneoso, foliis ovato-oblongis obtusis inferne in partem petioliformem lineari-oblongam angustatis longe decurrentibus 3-nervibus chartaceis supra araneoso-pubescentibus subtus dense albo-tomentosis, capitulis parvulis heterogamis 8–10-flosculosis in cyma pedunculata breviter ramosa densicephala bracteata dispositis, bracteis elongatis foliis similibus sed minoribus et angustioribus, involucri 4-serialis anguste campanulati phyllis exterioribus ovato-oblongis araneosis interioribus oblongis glabris omnibus obtusis vivide aureis haud radiantibus, receptaculo convexiusculo, flosculis fem. 2 harum corollæ lobis bene evolutis, achæniis immaturis compressiusculis papillosis, pappi setis scabriusculis pallide stramineis.

Hab. Punkalonga, South Rhodesia, 6000 ft.; *E. R. Sawer*.

Folia in toto 3·0–6·0 cm. long., 1·0–1·5 cm. lat., summa paullo minora, pars petioliformis solemniter 1·5–2·0 cm. long. et 0·2–0·3 cm. lat.; nervi fac. sup. parum perspicui, fac. inf. bene eminentes. Pedunculus circa 3·0 cm. long. Cyma 3·5 cm. diam. Bracteæ inferiores 1·0–1·5 cm. long. vel etiam majus, summæ anguste lineares, adusque 0·2 cm. imminutæ. Capitula 0·25 cm. long., 0·15 cm. diam. Involucri phylla 0·2 cm. long., exteriora 0·13 cm., interiora 0·1 cm. lat. Flosculi vix 0·2 cm. long. Fll. fem. corollæ lobi ovato-oblongi, 0·04 cm. long. Antherarum caudæ simplices. Styli rami apice truncati. Achænia 0·04 cm., pappi setæ 0·16 cm. long.

Near *H. gymnocomum* DC. and *H. odoratissimum* Less., the chief points of difference being the broad leaves, the markedly smaller heads and the different involucral leaves. The heads are almost exactly those of *H. cymosum* Less., a species belonging to another section of the genus.

Senecio pleistocephalus, sp. nov. Erectus, ramosus, glaber, ramis crassiusculis rarifoliosis, foliis sessilibus oblongo-spathulatis

vel anguste obovatis obtusis margine angustissime cartilagineis undulatis dentatisve crassiusculis, capitulis parvis homogamis discoideis 6–7-flosculosis in corymbis latis terminalibus sat elongatis bracteatis permulticapitulatis digestis, pedunculis propriis gracilibus capitula circa æquantibus ultimis vero quam ea brevioribus, involucri tubuloso-campanulati phyllis 5–6 oblongis obtusis margine membranaceis nequaquam sphacelatis quam calyculi phylla pauca late subulata multo majoribus, flosculis exsertis luteis, receptaculo fimbrillifero, styli ramis truncatis penicillatis, achæniis angustis subteretibus obscure costatis glabris, pappi setis scabriusculis basi in annulum brevem persistentem connatis albis.

Hab. Swaziland, near Miles; *J. B. Davy*, 2906. (Also—at Kew—Delagoa Bay; *Monteiro*, 25.)

Folia radicalia ignota. Caulis sat crassus, sc. 0·5 cm. diam.; rami tenuiores. Folia adusque 6·0 cm. long., sæpius vero 4·0–5·0 cm., et 1·0–1·5 cm. lat., nervæ in sicco fere evanidæ. Corymbi ± 12·0 cm. long. et diam. Bracteæ inferiores folia referentia, modice 2·0–3·5 cm. long., juniores 0·1–0·5 cm. long. Pedunculi proprii ± 0·8 cm. long. Involucrum 0·4 × 0·25 cm.; calyculi phylla circa 0·1 cm. long. Corollæ a basi leviter ac gradatim dilatatæ, 0·7 cm. long.; lobi lanceolati, obtusiusculi, 0·1 cm. long. Styli rami 0·15 cm. long. Achænia vix matura 0·2 cm., pappus 0·7 cm. long.

Flowering-heads somewhat like those of *S. isatideus* DC., but, since the stems and leaves are somewhat fleshy, it should find a more natural place among the Kleinias. The wide many-headed corymbs and small capitula with few involucral leaves and florets are the chief distinguishing features.

Pachycarpus scaber N. E. Br. in Fl. Trop. Afr. iv. 377.
Swaziland, near Bremersdorp, 2932.

Solanum indicum L. Sp. Pl. 187.
Carolina District, alien along main trek roads, 2945.
Now first recorded from South Africa.

Streptocarpus (§ Rosulatæ) **Davyi**, sp. nov. Caule brevissimo incrassato, foliis adusque 5 obovato-oblongis obtusis margine crenato-serratis basin versus gradatim attenuatis subsessilibus vel breviter petiolatis præsertim in nervis strigoso-hirtis membranaceis in sicco viridibus, cymis sæpissime 5–8-floris simplicibus compositisve pedunculis gracillimis glanduloso-pubescenti-hirtis folia subæquantibus ex axillis superioribus solitatim vel binatim ortis suffultis, pedicellis raro calyci æquilongis pubescentibus, calycis lobis anguste linearibus acutis vel obtusiusculis glandulo-pubescentibus, corollæ parvæ extus puberulæ tubo calycem duplo excedente angusto fere recto limbo parum zygomorpho brevi, antheris conniventibus, staminodiis 3 quorum 2 sat longis apice clavatis tertio ad merum filamentum brevem reducto, ovario styloque glanduloso-pubescente.

Hab. Swaziland, in the partial shade of rocks on kopjes above em-Babaan; *J. B. Davy*, 2836.

Caules summum 1·0 cm. long. Folia sæpius 10·0–15·0 cm.

long., et 4·0–7·0 cm. lat.; costa centralis incrassata, subtus magnopere eminens; costæ secundariæ complures, sat approximatæ, ascendenti-patulæ, juxta margine per paria subito arcuato-conjunctæ. Pedunculi circiter 10·0 cm. long. Pedicelli summum 0·4 cm. long., sæpissime vero breviores. Calycis lobi inter se parum inæquales, 0·5–0·6 cm. long., 0·05 cm. lat. Corolla tota 1·5 cm. long.; tubus 1·2 cm. long., basi 0·22 cm., juxta medium 0·33 cm., faucibus 0·3 cm. diam. Labii antici lobi late obovati, obtusissimi, 0·2 cm. long., laterales vix 0·2 cm. intermedius 0·25 cm. lat.; labii postici lobi 0·15 cm. long. et lat. Filamenta tubo ad 0·33 cm. a basi inserta, 0·4 cm. long.; antheræ 0·14 cm. long.; staminodia longiora 0·25 cm., tertium 0·1 cm. long. Discus 0·03 cm. alt. Ovarium 0·5 cm. long.; stylus ovarium æquans; stigmatis lamellæ 0·1 cm. lat.

Near *S. Bolusi* C. B. Cl., but easily known, among other characteristics, by the different corollas with very small limb.

Streptocarpus (§ Rosulatæ) **cyaneus**, sp. nov. Caule prostrato parum elongato folia 4 gerente, foliis lineari-oblanceolatis infra medium in portionem angustam petioliformem angustatis apice obtusis margine dentato- vel crenato-serratis utrinque sed præsertim pag. inf. hirto-pubescentibus, pedunculis solitariis attenuatis piloso-pubescentibus folia majora subæquantibus minora excedentibus, cymis bifloris, pedicellis mox calycem excedentibus, calycis lobis anguste lineari-oblongis obtusis piloso-pubescentibus, corollæ mediocris extus puberulæ tubo calycem longe excedente fere recto a basi usque ad fauces gradatim amplificato in sicco antice dilute lutescente limbo zygomorpho magnilobo cyaneo, antheris cohærentibus, staminodiis minimis, ovario pubescente, stylo glanduloso-pubescente.

Hab. Swaziland, on rocks and tree-trunks in dense shade at Forbes Reef; *J. B. Davy*, 2747.

Caulis adusque 3·0 cm. long. Folia breviora 10·0 cm., longiora 14·0–15·0 cm. long., 2·0–3·0 cm. lat.; costa centralis latus, haud eminens; costæ secundariæ utrinque circa 16, aperte arcuatæ. Pedunculi paullo ultra 10·0 cm. long., 0·03 cm. diam. Pedicelli vix 1·0 cm. long. Calycis lobi 0·35–0·4 cm. long., 0·08–0·1 cm. lat. Corolla tota 3·0 cm. long.; tubus basi 0·25 cm., juxta medium 0·5 cm., faucibus 1·5 cm. diam., sursum præsertim postice dilute vel dilutissime cyaneus; lobi antici rotundati, 0·9 × 1·0 cm.; lobi postici 0·8 cm. × 0·8 cm. Filamenta tubo ad 1·2 cm. a basi inserta, 0·7 cm. long., late complanata, linea vascularis valde perspicua; staminodia 0·1 cm. long., aliquanto complanata, truncata. Discus 0·05 cm alt., margine conspicue marginatus. Ovarium stylo æquilongus, 1·2 cm. long.; stigmatis lamellæ 0·15 cm. lat.

From *S. Rexii* Lindl., to which it is nearest, easily distinguished at a glance by the smaller differently shaped corolla.

Hemizygia foliosa, sp. nov. Caule erecto ex axillis inferioribus ramulos breviores gignante bene folioso scabride pubescente, foliis pro rata amplis subsessilibus ovato-oblongis obtusis basi paullulum angustatis margine a medio usque ad apicem crenulato-serratis ceterum integris firme membranaceis eleganter nervosis minute scabriusculo-pubescentibus glandulis lucentibus copiosissime

indutis, verticillastris bifloris mox distantibus in spicastris terminalibus ramosis elongatis pubescentibus dispositis, bracteis ovatis vel oblongo-ovatis acutis acuminatisve mox dehiscentibus puberulis violaceis, calycis florescentis puberuli tubo sursum paullulum ampliato lobo postico late rotundato obtusissimo purpureo lobis reliquis setaceis æquilongo sed tubo breviore, calycis fructescentis tandem decurvi vix aucti tubo anguste campanulato, corollæ tubo calycem subæquante labii postici 3-lobi lobis lateralibus brevissimis rotundatis lobo centrali ovato-oblongo obtusissimo labio antico suborbiculari quam posticus longiore, staminibus longe exsertis filamentis anticis alte connatis posticis inter se liberis, stylo apice bifido.

Hab. Swaziland, open veldt at em-Babaan; *J. B. Dary*, 2833.

Planta tempore florendi saltem 40·0 cm. alt. Folia 5·0–7·5 cm. × 2·5–3·0 cm.; costæ secundariæ utrinque circa 5, inferiores sæpissime ascendentes superiores arcuatæ, costularum rete utrobique satis perspicuum; petioli 0·2–0·3 cm. long., supra late canaliculati. Spicastra 20·0 cm. long.; horum bracteæ sæpissime 1·0–1·5 cm. long. Pedicelli graciles, 0·2–0·5 cm. long. Calyx florescens humectatus in toto 1·05 cm. long.; tubus 0·8 cm. × 0·45 cm., postice ut lobi violaceus; lobi 0·25 cm. long., posticus 0·35 cm. lat., plane nervosus. Corollæ tubus 0·9 cm. long.; labium anticum 0·6 cm. × 0·65 cm.; posticum 0·4 cm. × 0·6 cm., hujus lobus centralis 0·18 cm. × 0·15 cm. Staminum posticorum filamenta usque ad 1·3 cm. exserti, anticorum usque ad 1·5 cm., horum pars libera modo 0·1 cm. long. Stylus totus fere 2·0 cm., rami 0·12 cm. long.

Probably nearest *H. Junodi* Briq., known to me only by description, from which it differs in leaf, larger bracts, calyx, exserted corolla, and other points. It cannot be satisfactorily placed in any of the sections proposed by Briquet.

Stachys sessilis Gurke in Engl. Bot. Jahrb. xxvi. 74.

Carolina District, one mile north of Robinson's, 2974.

WILTS PLANT NOTES, 1904.

By Rev. E. S. Marshall, M.A., F.L.S.

The following observations were made in May and early June, with few exceptions. Districts 1, 8 of Fl. Pl. Wilts are in S. Wilts; 2, 4 in N. Wilts; 7 partly in both. Additions to the county list are starred.

Ranunculus trichophyllus Chaix. 8. Small ponds on chalk, Ebbesbury Hill and Groveley Castle; a peculiar yellowish-green form, with minute flowers often produced under water, which I at first took for a state of the following.—*R. Drouetii* Godr. 1. Near Wick Farm, Keevil; Ashton Mill, Steeple Ashton.—*R. heterophyllus* Fr. 1. Pond near Keevil.—*R. sceleratus* L. 7. Patney.—*R. Flammula* L. 2. Between Rowde and Bromham.

Fumaria densiflora DC. 8. Chalky cornfields about Wishford.

—*F. Vaillantii* Lois. 2. Plentiful in a cornfield on Beacon Hill, above Nether Street, at 600 ft.; new for N. Wilts.

Cardamine pratensis L. A marked plant with milk-white blossoms, growing with the ordinary form in meadows between Rowde and Bromham (2), and near Patney Station (7), is named var. **palustris* (Peterm.) by Mr. Arthur Bennett. It agrees fairly well, I think, with the description in DC. *Prodromus* of *C. dentata* Schult.: "Foliis pinnatisectis, segmentis petiolulatis, radicalium subrotundis, caulinorum oblongis basi attenuatis, ultimo cuneato, siliquis oblique erectis latitudine stylum adæquantibus."

Erophila præcox DC. 7. Downs, Alton Barnes; scarce.

Sisymbrium Thalianum J. Gay. 2. Bromham.

Brassica Rapa L. var. *sylvestris* H. C. Watson. 1. Banks of the Avon, between Bradford and Freshford; to all appearance native.

Diplotaxis muralis DC. 2. A weed at Seend Station.

Viola hirta L. 2. Roundway Downs. — *V. silvestris* Reich. 8. Wylye.

Polygala oxyptera Reich. 2. Roundway Downs. 8. Near Wishford.—*P. calcarea* F. Schultz. Abundant on the chalk in all five districts.

Cerastium tetrandrum Curt. 1. Coulston Down, between Tinhead and Imber (600 ft.). 2. On limestone (500 ft.), between Warleigh and Inwood, in Monkton Farleigh parish. 7. White Horse Down, Alton Barnes (700–900 ft.). New for N. Wilts; very local and dwarf in all three stations.—*C. pumilum* Curt. 7. Downs (600–850 ft.) above Alton Barnes and Stanton St. Bernard; new for N. Wilts. — *C. semidecandrum* L. 1. Coulston Down. 7. Alton Barnes (700 ft.). 8. Ebbesbury Hill, Wishford. — *C. arvense* L. 1. Down, north of Imber.

Arenaria leptoclados Guss. 1. Coulston Down (600 ft.). 8. Common around Wishford.

Sagina apetala L. var. *prostrata* Bab. 2. Seend Station.

Trifolium medium L. 7. Near Patney. — *T. filiforme* L. 4. Grassy ride, on gravel, at the north-west end of Savernake Forest; with it grew a curious little *Euphrasia*, having the facies of *E. curta* Fr., but the long-stalked glands of *E. Rostkoviana*.

Lotus uliginosus Schkuhr. 2. Bromham.

Rubus rosaceus Wh. & N. var. *infecundus* Rogers. 2. Wood on Roundway Hill.—*R. corylifolius* Sm. 7. Patney.

Geum rivale × *urbanum* (*G. intermedium* Ehrh.). 7. Between All Cannings and Patney. 8. Ebbesbury Copse, Wishford, in great variety.

Rosa micrantha Sm. 2. Nether Street.

Saxifraga granulata L. 1. In profusion on Coulston Down, spread over perhaps thirty acres. 7. Summit of Clifford Hill; in damp meadows, Patney. 8. Wishford Downs.

Epilobium angustifolium L. 8. Groveley Wood; native.

Œnanthe crocata L. 2. Bromham. 8. Little Langford to Wylye.

Galium palustre L. var. *elongatum* (Presl). 8. Hanging Langford.—*G. uliginosum* L. 2. St. Edith's Marsh, Bromham.

Valeriana Mikanii Syme. 2. Inwood, &c.; rather frequent on the Bath oolite. — *V. sambucifolia* Willd. 2. Nether Street. 7. Patney.

Anthemis arvensis L. 8. Wishford.

Senecio campestris DC. 1. Imber Downs. 4. Cherhill Downs. 7. Alton Barnes to All Cannings. 8. Wishford and Little Langford Downs. Far more abundant and generally distributed in Wilts than in any other county that I know.

Arctium majus Bernh. 1. Edington.

Carduus crispus L. 2. Devizes, &c. 7. Alton Barnes; likewise *Serratula*, sparingly.

Crepis taraxacifolia Thuill. 2. Near Rowde.

Hieracium Auricula* L. 1. Pasture, far from houses, about three-quarters of a mile north-east of Keevil; only one patch, three to four feet across. Although no probable means of introduction occurs to me, I much doubt its being indigenous there. Hudson (*Flora Anglica*) recorded this species from Dalehead, near Grasmere, Westmorland, and it has recently occurred (apparently as an alien) near Belfast. Judging by the continental distribution, it should be found truly wild in Britain.—H. maculatum* Sm. 1. In great quantity on rocky limestone railway banks between Limpley Stoke and Freshford; unlike the Chichester plant, it has decidedly pilose-tipped ligules. A single specimen was seen at Westbury Station, probably derived from this source.

Taraxacum palustre* DC. 7. Damp meadow near Patney Station; a few specimens found here are clearly *T. officinale* × *palustre*.—T. udum* Jord. I am now of opinion that this is a subspecies, somewhat intermediate between *officinale* and *palustre*, though nearer the second; the British plant usually so named cannot be a hybrid, as it grows freely in neighbourhoods where *palustre* is unknown. In Wilts, as in some other southern counties, it is abundant on many of the chalk hills in spring time. 1. Imber Downs. 2. Monkton Farleigh; Roundway Downs. 7. Alton Barnes to All Cannings; extending into Dist. 4. 8. Wishford, &c. Varies much in size and leaf-cutting, according to situation.

Lactuca muralis Fresen. 2. Monkton Farleigh.

Specularia hybrida A. DC. 1. Imber.

Veronica montana L. 2. Inwood; Bromham.

Lamium amplexicaule L. 1. Between Tinhead and Imber. 2. Bromham. 8. Wishford.

Polygonum Bistorta L. 7. Alton Barnes.

Euphorbia amygdaloides L. 2. Monkton Farleigh; Bromham.

Humulus Lupulus L. 2. Withy-bed, St. Edith's Marsh.

Parietaria officinalis L. 2. Bromham.

Taxus baccata L. 2. Monkton Farleigh; native on limestone rocks.

Orchis ustulata L. 1. Near Imber. 7. Alton Barnes. 8. Downs above Wishford and Little Langford; locally abundant.

Habenaria bifolia R. Br. 1. About Imber. 2. Beacon Hill, 8. Wishford and Little Langford.

Iris fœtidissima L. 8. Outlying copse, Groveley Wood.

Allium vineale L. 7. Alton Barnes.—*A. ursinum* L. 2. Inwood and Conkley.

Ornithogalum pyrenaicum L. 2. Inwood; abundant.

Colchicum autumnale L. 2. Monkton Farleigh.

Paris quadrifolia L. 2. Withy-bed, St. Edith's Marsh.

Juncus glaucus Leers. 2. Frequent about Rowde and Bromham.

Luzula vernalis DC. 8. Groveley Wood; Wylye.

Sparganium ramosum Huds. var. **microcarpum* Neuman. 1. Pond at Edington Monastery.

Potamogeton perfoliatus L. 1. Canal, near Limpley Stoke.—*P. crispus* L. 1. Keevil; Devizes; Limpley Stoke.—*P. densus* L. 1. Devizes; Limpley Stoke.—*P. Friesii* Rupr. 7. Canal, Alton Barnes.

Scirpus sylvaticus L. 2. Nether Street.

Carex intermedia Good. 7. Between All Cannings and Patney; Little Langford.—*C. vulpina* L. 2. Limpley Stoke. 7. Patney, Alton Barnes, &c. 8. Little Langford to Wylye.—*C. muricata* L. 7. Patney. 8. Near Wishford. A form with subdistant spikelets, superficially resembling the next; from which Pfarrer Kükenthal points out that it differs, besides the fruit-character, by the very long ligule and the non-squarrose spikelets. It appears to be *C. contigua* Hoppe var. *remota* F. Schultz.—**C. Leersii* F. Schultz. 4. Roadside bank near Marlborough (passed by Kükenthal as typical); also close to Savernake Station.—*C. divulsa* Good. 8. Little Langford.—*C. remota* L. 2. About Bromham and Rowde. 7. Patney, Alton Barnes, &c.—*C. ovalis* Good. 2. St. Edith's Marsh.—*C. acuta* L. 7. In plenty near Patney and Alton Barnes. 8. Little Langford.—**C. acuta* × *Goodenowii*. 7. Meadow, south of Alton Barnes, with the parents.—*C. Goodenowii* J. Gay. 7. Patney, &c. 8. Little Langford.—*C. verna* Chaix. Almost everywhere, I believe.—*C. panicea* L. 2. St. Edith's Marsh. 7. Patney, Alton Barnes, &c. 8. Little Langford to Wylye.—*C. pendula* Huds. 2. Nether Street.—*C. distans* L. Several meadows in Keevil parish.—*C. hirta* L. 1. Limpley Stoke. 2. Bromham; canal, below Conkley Wood. 7. Patney, &c.—*C. riparia* L. 1. Avon banks, above Bradford; Baldham, Keevil.

Milium effusum L. 2. Inwood. 8. Groveley Wood.

Aira præcox L. Monkton Farleigh.

Avena pratensis L. 1. Imber. *A. pubescens* Huds. is common both on chalk and limestone.

Melica uniflora Retz. 2. Inwood.

Poa pratensis L. var. *subcærulea* (Sm.). 1. Keevil. 8. Little Langford.

Festuca rigida Kunth. Downs near Wishford.—*F. pratensis* Huds. 7. Patney.

Bromus erectus Huds. 1. Imber Downs. 2. Roundway Downs.

Brachypodium pinnatum Beauv. 2. Roundway Downs; scarce.

Equisetum maximum Lam. 2. Nether Street. 7. Patney.

Chara fragilis Desv. 8. Pond on Ebbesbury Hill, Wishford (*teste* Groves).

THE STABILITY OF TRIVIAL NAMES.

By W. P. Hiern, M.A., F.R.S.

"Caveant autem quam sanctissime omnes sani botanici, unquam proponere nomen triviale sine sufficiente differentia specifica, ne ruat in pristinam barbariem scientia. Mutatio horum, licet in melius, plus nocet quam proderit."

The caution quoted above was contained in the preface to the first edition of Linnæus's *Species Plantarum* (1753), and repeated in the second edition in 1762. The propriety of the principle involved in the latter part of the paragraph is generally recognized, although diverging opinions exist with reference to the scope of its application. A great crowd of botanists consider that it does not cease to apply when the generic name of a species is altered and a new binomial name brought into use; they contend that the trivial part must still be retained if possible, and some go so far as to insist that the rule is inexorable, even though, under the altered relations, the trivial name becomes tautological, contradictory, absurd, or otherwise unsuitable. On referring to the context where the passage occurred, it is seen that Linnæus had just explained how, in the body of his book, he had placed in the margin the trivial names against the descriptions of the species. It might perhaps be urged that an alteration of the marginal name would not affect the generic part of the binomial, and that therefore the caution was not intended to contemplate the case of a change in the generic name.

It seems, however, that it is almost impossible to say for certain to what extent Linnæus intended his caution to apply, and the most satisfactory method to come to a sound view as to the probabilities on this point is to examine, and in a summary manner to exhibit, the practice of the author himself in his subsequent writings. While the authority of Linnæus in nomenclature may not be absolute, all botanists must hold in high respect the lead given by this great master in the matter.

Linnean synonyms can be arranged under the following eleven heads:—

1. *The trivial name changed, without change in the generic name.*—There are about two hundred instances; for example:—

Tournefortia glabra, Sp. Pl. ed. 1, p. 141, n. 6 (1753); Syst. ed. 10, n. 6 (1759) = *Tournefortia cymosa*, Sp. Pl. ed. 2, p. 202, n. 5 (1762); Syst. ed. 13, p. 161, n. 5 (1774).

These instances show that Linnæus did not hesitate to set aside his own caution whenever, for sufficient reasons, it seemed to him desirable to do so. It is not safe to assume that he claimed greater discretionary power for himself than he desired other authors to possess. At the same time it is generally agreed that much greater strictness must now be observed in such cases than was exercised by the older botanists.

2. *The trivial name changed, with change in the generic name.*—There are about one hundred and seventy instances; for example:—

Satureja origanoides, Sp. Pl. ed. 1, p. 568, n. 9 (1753) = *Cunila mariana*, Syst. ed. 10, app. p. 1359 (1759); Sp. Pl. ed. 2, p. 30, n. 1 (1762); Syst. ed. 13, p. 63, n. 1 (1774).

In a few of the instances the trivial name was changed in order to avoid confusion with the name of another species.

In a very few of the instances a new binomial has been formed in order to restore the original trivial name, as for example:—

Euphorbia viminalis, Sp. Pl. ed. 1, p. 452, n. 9 (1753); Sp. Pl. ed. 2, p. 649, n. 9 (1762) = *Cynanchum aphyllum*, Syst. ed. 12, iii. app. p. 235 (1768) = *Cynanchum viminale*, Mant. ii. p. 392 (1771); Syst. ed. 13, p. 212 (1774).

On the other hand, in scarcely so few of the instances an opposite course has been taken, as for example:—

Chrysogonum peruvianum, Sp. Pl. ed. 1, p. 920, n. 2 (1753) = *Zinnia peruviana*, Syst. ed. 10 (1759) = *Zinnia pauciflora*, Sp. Pl. ed. 2, p. 1269, n. 1 (1763).

3. *The trivial name retained, with change of the generic name.*—There are about two hundred and forty instances; for example:—

Triticum caninum, Sp. Pl. ed. 1, p. 86, n. 7 (1753) = *Elymus caninus*, Fl. Suec. ed. 2, n. 112 (1755); Syst. ed. 10 (1759); Sp. Pl. ed. 2, p. 124, n. 8 (1762); Syst. ed. 13, p. 107, n. 8 (1774).

There is no instance of the principle of retention so exercised as to make the trivial name identical with the generic; to avoid such a result the trivial name is always changed.

4. *Trifling changes in the trivial name.*—There are about one hundred and seventy instances; for example:—

Myosotis virginiana, Sp. Pl. ed. 1, p. 131, n. 2 (1753) = *Myosotis virginica*, Sp. Pl. ed. 2, p. 189, n. 2 (1762).

Gomphrena vermicularis, Sp. Pl. p. 224, n. 6 (1753); Syst. ed. 10, p. 950 n. 6 (1759) = *Illecebrum vermiculatum*, Sp. Pl. ed. 2, p. 300, n. 10 (1762); Syst. ed. 13, p. 207, n. 10 (1774).

Several of these instances are misprints or mere oversights, while many may be regarded as but slight improvements.

5. *Priority of place disregarded.*—There are about fifteen instances; for example:—

Clitoria lactescens, Syst. ed. 10, p. 1172 (1759) + *Glycine Galactia*, Syst. ed. 10, p. 1173 (1759) = *Clitoria Galactia*, Sp. Pl. ed. 2, p. 1026, n. 5 (1763).

Acrostichum pulchrum, Sp. Pl. ed. 1, p. 1072, n. 25 (1753) + *Asplenium Adiantum nigrum*, Sp. Pl. ed. 1, p. 1081, n. 14 (1753) + *Asplenium Onopteris*, Sp. Pl. ed. 1, p. 1081, n. 16 (1753) = *Asplenium Adiantum nigrum*, Sp. Pl. ed. 2, p. 1541, n. 23 (1763); Syst. ed. 13, p. 785, n. 23 (1774).

It may be concluded from these instances that priority of place was not regarded by Linnæus as of much, if any, importance.

6. *Variety α not adopted as the type when the species is divided.*—There are about thirteen instances; for example:—

GERANIUM TRISTE, α, Sp. Pl. ed. 1, p. 676, n. 2, α (1753) = *Geranium lobatum*, Sp. Pl. ed. 2, p. 950, n. 23 (1763); Syst. ed. 13, p. 513, n. 23 (1774);

GERANIUM TRISTE, β and γ, Sp. Pl. ed. 1, p. 676, n. 2, β and γ (1753) = *Geranium triste*, Sp. Pl. ed. 2, p. 950, n. 24 (1763); Syst. ed. 13, p. 513, n. 24 (1774).

7. *The variety taken as the type when the species is divided.*—There are a few instances; for example:—

PHILLYREA ANGUSTIFOLIA, Sp. Pl. ed. 1, p. 7, n. 1, β (1753) = *Phillyrea angustifolia*, Syst. ed. 10, n. 2 (1759); Sp. Pl. ed. 2, p. 10, n. 2 (1762); Syst. ed. 12, n. 2 (1767); Syst. ed. 13, p. 54, n. 2 (1774);

PHILLYREA ANGUSTIFOLIA, Sp. Pl. ed. 1, p. 7, n. 1, excl. var. β (1753) = *Phillyrea media*, Syst. ed. 10, n. 1 (1759); Sp. Pl. ed. 2, p. 10, n. 1 (1762); Syst. ed. 12, n. 1 (1767); Syst. ed. 13, p. 54, n. 1 (1774).

OCHNA JAPOTAPITA, Sp. Pl. ed. 1, p. 513, n. 1, γ (1753) = *Ochna Jabotapita*, Sp. Pl. ed. 2, p. 732, n. 2 (1762); Syst. ed. 12, n. 2 (1767); Syst. ed. 13, p. 409, n. 2 (1774);

OCHNA JAPOTAPITA, Sp. Pl. ed. 1, p. 513, n. 1, excl. var. γ (1753) = *Ochna squarrosa*, Sp. Pl. ed. 2, p. 731, n. 1 (1762); Syst. ed. 12, n. 1 (1767); Syst. ed. 13, p. 409, n. 1 (1774).

8. *The varietal name adopted as the trivial name when the variety is taken as a species.*—There are about nineteen instances; for example:—

MALVA VERTICILLATA β CRISPA, Sp. Pl. ed. 1, p. 689, n. 12, β (1753) = *Malva crispa*, Syst. ed. 10, n. 13 (1759); Sp. Pl. ed. 2, p. 970, n. 17 (1763); Syst. ed. 12, n. 17 (1767); Syst. ed. 13, p. 520, n. 17 (1774).

9. *The varietal name not adopted as the trivial name when the variety is taken as a species.*—There are about twenty-four instances; for example:—

SCABIOSA LEUCANTHA β SPURIA, Sp. Pl. ed. 1, p. 98, n. 3, β (1753) = *Scabiosa rigida*, Pl. Rar. Afr. p. 8, n. 4 (1760); Sp. Pl. ed. 2, p. 142, n. 5 (1762); Amoen. Acad. vi. p. 84, n. 4 (1763); Syst. ed. 12, n. 5 (1767); Syst. ed. 13, p. 120, n. 5 (1774).

10. *The trivial name abandoned when the species is divided.*—There are about sixteen instances; for example:—

SALICORNIA EUROPÆA (α) HERBACEA, Sp. Pl. ed. 1, p. 3, n. 1 (α) (1753) = *Salicornia herbacea*, Sp. Pl. ed. 2, p. 5, n. 1 (1762); Syst. ed. 12, n. 1 (1767); Syst. ed. 13, p. 50, n. 1 (1774);

SALICORNIA EUROPÆA β FRUTICOSA, Sp. Pl. ed. 1, p. 3, n. 1, β (1753) = *Salicornia fruticosa*, Sp. Pl. ed. 2, p. 5, n. 2 (1762); Syst. ed. 13, p. 51, n. 2 (1774).

SPONDIAS MOMBIN, Sp. Pl. ed. 1, p. 371, n. 1 (1753) = *Spondias purpurea*, Sp. Pl. ed. 2, p. 613, n. 1 (1762) + *Spondias lutea*, Sp. Pl.

ed. 2, p. 613, n. 2 (1762). The name *Spondias Mombin* is, however, retained in Syst. ed. 13, p. 375, n. 1 (1774).

11. *The trivial name retained when the species is divided.*—There are several instances; for example:—

ACER MONSPESSULANUM, Sp. Pl. ed. 1, p. 1056, n. 8, excl. β (1753); Syst. ed. 10, n. 8 (1759); Sp. Pl. ed. 2, p. 1497, n. 8 (1763); Syst. ed. 12, n. 8 (1767); Syst. ed. 13, p. 766, n. 8 (1774);

ACER MONSPESSULANUM, β, Sp. Pl. ed. 1, p. 1056, n. 8, β (1753) = *Acer orientale*, Syst. ed. 10, n. 8 A (1759) = *Acer creticum*, Sp. Pl. ed. 2, p. 1497, n. 9 (1763); Syst. ed. 12 (1767); Syst. ed. 13, p. 766, n. A (1774).

SOWERBY'S DRAWINGS OF FUNGI.

By WORTHINGTON G. SMITH, F.L.S.

(Continued from p. 160.)

46. CANTHARELLUS CIBARIUS Fr. There is an additional figure in the original for this plate, and a slight outline of another and large example. There is also a second drawing of three wholly coloured figures unengraved.

47. CANTHARELLUS TUBÆFORMIS Fr. There are six additional figures on the original drawing for this plate. The section in the original is $1\frac{1}{2}$ in. longer, and the pileus more than $\frac{1}{2}$ in. more in diameter. In reference to the gills and bark of the stem Sowerby writes, "easily separates or scales off."

48. AGARICUS (COLLYBIA) RADICATUS Relh. The original of this is an uncoloured outline. A second sheet illustrative of this species is in colours, with an added sketch of a broken stem, and the note, "When fresh breaks short at right angles." A third sheet contains eight coloured figures and several notes, one being, "Very slimy and glutinous in wet weather." There is also an additional pencil sketch of a young example growing from a piece of root.

MORCHELLA ESCULENTA Pers. Two species of *Morchella* are represented on this plate; the two central figures are *M. semilibera* DC., the others *M. esculenta* Pers.

51*a*. M. ESCULENTA Pers. The figure on the left hand is one-fourth more in diameter than the original; the latter is without a cut-off base, and is altogether better drawn and less formal than the plate. The original of the right-hand figure is $\frac{3}{4}$ in. less in height, and is much more natural in appearance. The smaller right-hand figure with its imaginary perforated apex does not exist in the original. There is a good section on the original, omitted from the plate. All the stems are unnatural on the plate. The word "Phallus" is written on the drawing.

51*b*. M. SEMILIBERA DC. The original of the two central figures of *M. semilibera* DC. are in the Dickson-Sowerby collection; the

original is much better than the plate, without any of its unnatural formality. Both figures are varied a little from the original. On the drawing is written "Phallus."

58. FISTULINA HEPATICA Fr. There are two drawings—a large and small—of this species, both distinct from the plate. On the larger is written, "Found universally on old living oaks and stumps &c about Stapleford in Essex, Kensington Gardens, &c., Middx. Vauxhall South Lambeth in the way to Kingston and plenty in petersham park and wherever I went." On the back of this drawing is a pencil sketch of a moderately large example, with a note, "Sept. 20, 1795 on an oak in Kensington of a fortnights growth from a button." The "button" is outlined $\frac{5}{8}$ in. diameter. On the back of the smaller drawing is written, "Little florets contain may the upper suport the male fructification and the under fistules the female." On both drawings are details of the separate tubes, with the note, "like plush velvet," and "Boletus Hippaticus."

61. AGARICUS (CLITOCYBE) GEOTROPUS Bull. There are two original sheets for this, one with a careful section of a young plant, unengraved. On a small outline, not engraved, is the note, "6 inches over"; elsewhere, "pleasant campestris tast." There is a supplementary sketch on the back of one sheet.

62. AGARICUS (PLEUROTUS) SUBPALMATUS Fr. This is a made-up group, and a second group on the original drawing is omitted. There is a second coloured drawing unengraved. The following notes are on the drawings, referring to the flesh: "A watery pith-like texture," and "Tast very bitter at the tongues end, did not try further," and "The end of some gills split, the powdery particles adhering or emitting."

66. HYGROPHORUS OVINUS Sow. The original of this is much paler in colour, and contains two additional figures, with the note, "Stipes generally compressed owing to the tenderness of the inside."

67. AGARICUS (PLEUROTUS) ULMARIUS Bull. This is a made-up plate; the large section at the base of plate is absent on the drawing, and a section of a smaller example on the drawing is absent from the plate. In reference to the stem Sowerby says, "finely wooly, when magd. but has a farinaceous appearance other ways"; he also says the plant has a "mealy smell." On the back of the original is written: "This Agc. altho extremely common on elms &c seems altogether to have escaped Engh authors. It varies in shape and size Ive seen the pileus more than 12 inches diameter, the stipes $\frac{1}{2}$ to 3 inches, sometimes 3 or 4 inches long, often nearly sescile it continues sometime on the tree if not devoured by slugs &c 3 months or more. I am apt to think the Ag. squamosus and tubæformis are sportive varieties of this species.* They are soft when fresh and have a strong mealy smell, they shrink much in

* "the dryed specimens appear as if the gills were decurrent."

drying and by degrees gets very hard." There is a second large drawing of this species by Sowerby on a sheet which measures 17 in. by 12 in. The artist has again used his unchanging body-white colour.

68. LENTICUS TIGRINUS Fr. There are nine figures on the plate, but four only on the original; of these, two are of the slightest possible character.

69. XYLARIA POLYMORPHA Grev. There is no original of this, but there is a drawing of this species in the Dickson-Sowerby collection with four figures and a section, and details of the perithecia. None of the figures resemble this plate.

71. HYGROPHORUS PENARIUS Fr. There is no original of this.

AGARICUS (MYCENA) PURUS Pers. The original is only partially coloured, and the colour on one pileus has the note, "More pinky." A second note says, "Tast like cabbage-stalk a little."

73. HYDNUM IMBRICATUM Linn. The original is a partly-coloured pencil drawing. The central figure of plate is $\frac{1}{2}$ in. less in diameter, the plant $\frac{3}{8}$ in. less in height, and the stem $\frac{1}{8}$ in. less in diameter. The original of the section is $\frac{3}{4}$ in. more in diameter, and $\frac{1}{2}$ in. less in height than plate. There is an enlarged detailed coloured sketch of the spines on the drawing, but omitted in the plate. On the back of the drawing is a note as follows: "Mr. Abbot fond in an old sand pit near the summer House at Old Warden, the Seat of Lord Ongley in Bedfordshre."

74. CRATERELLUS CORNUCOPIOIDES Fr. There is a large partially-coloured drawing of this with many figures, but none agree with the plate. There is a note, "opaque earthy substance."

75. CRATERELLUS CRISPUS Fr. Taken from a partly coloured drawing which has several additional figures; the lower figures appear to represent the very different *C. clavatus* Fr. Sowerby notes these as "variety solid pileus."

76. AGARICUS (TRICHOLOMA) TERREUS Schæff. There is an original of this, together with four other drawings of the same species; on one of the latter is written, "Gills apt to separate."

77. AGARICUS (PHOLIOTA) SPECTABILIS Fr. This is made up from a larger original. The colour of the original is somewhat olive-ochre, and very different from the full vinous-orange of the plate.

80. GEASTER FIMBRIATUS Fr. The original is a partially-coloured drawing of four examples, and without the two infant specimens on the plate. On one figure, not engraved, is a note as follows: "Fresh gathered ampthill in drying proved to be the stellatum according with what Mr. Woodward say in withg."

81. MARASMIUS PORREUS Fr. In the original there are two additional figures. The colour in the plate is a trifle browner, and the stem of the larger example is not quite so thick in the original.

82. HYGROPHORUS PSITTACINUS Fr. This is made up from eleven figures contained on two drawings; only seven are reproduced on the plate.

86. POLYPORUS GIGANTEUS Fr. There is no original for this.

87. POLYPORUS INTYBACEUS Fr. The original, which is uncoloured, is 1½ in. taller, and 2 in. broader. On the back of the drawing is written: "I have found this in Kensington g^ds. Hainhault Forrest, &c., in the autumnal months, it will frequently form large masses of 2 or more feet in circumference, generally near some tree, but not attached, they branch and innosculate and have lateral shoots, &c., &c., in a very curious manner the top is generally of a greyish brown the sides lighter the pores in all I've seen are very white we find it difficult to dry specimens, it is so possesed with larva."

88. POLYPORUS ULMARIUS Fr. The original is an uncoloured outline, the width being ¾ in. more, and the depth ¼ in. more than the plate. The left-hand section is ½ in. deeper, and ⅛ in. less in projection than original. A note written on the back of the drawing runs: "May be found growing fresh in rotten elms most of the year if the weather is wet or damp being generally a shapeless mass being often attached to the upper surface little more than a mucory edge of the rugged whitish and tough pileus is to be seen the pores or tubes are sometimes in many irregular stratur beneath some deeper than others of a light cream colour when young, afterwards a bright orange decaying brown, has not this escaped the notice of cryptogamists hitherto? I have a large specimen from a cellar which grew between the right angle of 2 brick walls without any aparent attachment to any wood the waters ousing from the wall must be very powerfully saturated with the matter to form such a dense vegetable altho strained through such a substance it gives a fine white farinaseous dust from the pores in the young state and when at maturity an orange-brown dust or seed."

89. POLYPORUS PICIPES Fr. The larger figures represent *P. picipes*, the smaller *P. elegans* var. *nummularius*. The originals are on one sheet, and not coloured. A note on the back of the drawing says: "Have found this in 4 different places on Willow, viz. at Lord spencers at Wimbleton in the early state Aug^st. 21, 1795, at Ranelagh also larger and later state at Batersea in Nover the early specimens are somewhat carnose and of a pale leather or tan colour but in the later season they asume a richer tan color, and are generally very thin and spreading."

90. CLAVARIA FRAGILIS Holmsk. There are twenty examples on the original drawing to sixteen on the plate. There are two notes—"Very brittle and tender," and "strong loamy soil."

92. AGARICUS (MYCENA) EPIPTERYGIUS Scop. There is a coloured original. A note states the membrane of pileus to be "very tough," and the plant is stated to be "glutinous all over and also stipes if damp weather."

93. MARASMIUS EPIPHYLLUS Fr. The original shows three ivy leaves, the plate two; there are sixteen examples in the original, fourteen on the plate. The uncoloured section in the plate is

coloured dark vinous on the drawing, and shown as cut in two. A note says, "From four to ten upwards."

94. Marasmius androsaceus Fr. The plate has twenty figures, but there are only nine in the original; these are beautifully drawn. There is no section on the original, but there is a magnified piece of stem.

95. Marasmius rotula Fr. This is not an exact copy of the original drawing; the group of five on the left is seven on the original. Another group of seven is slightly pencilled, and the note "20 perhaps" added; at the base is written, "and on the yew in great plenty." At the back of the drawing is written: "Certainly distinct from Ags androsaceus? much more common sometime is parasitic on itself when fallen by being trod on or old plants or other accident I've seen it also branching very much the stipes is of a durable nature we may find old branching stems of the former years plant the spring I found it this spring 1795 in abundance those the preceeding winter was the severest for some years."

96. Bolbitius fragilis Fr. There is a good coloured original of this with an additional pencil outline. In the plate the colour of the pileus and stem is not like the pale sulphur original. In reference to the larger figure with a green tinge, Sowerby has written: "Pileus very thin, transparent and glutinous gills very thin stipes striate, brittle, breaks at right angles."

97. Agaricus (Claudopus) variabilis Pers. There is the following note on the original: "very common in moist woods on broken stick sometimes on decayed branches of living, shape varies from its attachment to the side or under surface of the cylinder on which it grows. I never saw it growing on near the upper half of the stick. I've seen it in large quantities and it clean and delicate whitness gave it a beautifull appearance it varies as figured, one stick is turnd upwards out of its nat^{l} position to the gills or under surface."

98. Agaricus (Crepidotus) mollis Schæff. The original of this is very slight and only partially coloured; there is a second outline sketch.

99. Agaricus (Pleurotus) mastrucatus Fr. The original is uncoloured and without notes; there is a second outline drawing of a larger group.

101. Agaricus (Armillaria) melleus Vahl. There is no original of this, but there is a slight sketch of *A. melleus*.

102. Cortinarius (Phlegmacium) multiformis Fr. The diameter of the upper figure is $\frac{1}{2}$ in. more, of the middle $\frac{1}{8}$ in. more, and the bottom $\frac{1}{4}$ in. more in the original. There is the following note, "smell strong, tast not agreeable with a bitterness in the throat."

103. Lactarius torminosus Fr. This plate is made up from four drawings; four examples are on the plate, nine on the drawings. On the gills of one section is the note, "rather more of a pinky color"; and near the drops of milky fluid, "white cream acrid."

104. Lactarius vellereus Fr. Fries has referred to this as *L. piperatus* Fr., but the distant—not crowded—gills point distinctly to *vellereus*. The original is on a drawing erroneously named *Russula nigricans*, and this shows a large as well as a small section. In the view the gills are not shown as branched, but there is a note on the drawing, "gills frequently branched": acting on this note Sowerby has made the gills in the plate branch very much, and in an unnatural manner. Another note says, "Lactescent, very biting hot tast."

105. Gomphidius viscidus Fr. There is a large wholly coloured drawing of this species, but not the original of the plate, as it differs both in drawing and colour. The medium size figure on right of plate is three inches taller, and $\frac{3}{4}$ in. more in diameter than plate. The gills, correctly coloured dull purple on the plate, are olive on the original. There is a large example, 7 in. × $4\frac{1}{2}$ in., on the drawing.

106. Agaricus (Tricholoma) murinaceus Bull. On the section of the stem on the original the word "satiny" is written, and at the bottom of the sheet, "brittle—tast unpleasant."

107. Agaricus (Omphalia) stellatus Fr. Fries thinks this may be the young state of 386. *A. umbelliferus* Linn., on account of the fleshy pileus, and he may be right. Sowerby's plant is snow-white, and the plate may be the white form of *umbelliferus*. Massee publishes the subject as a species under Sowerby's name of *A. buccinalis*, and says it is "too fleshy to be the same as *stellatus*." The section, however, on the original drawing is much less fleshy than the plate, the drawing having been carelessly copied by Sowerby. I incline to the belief that the drawing represents *A. stellatus*.

108. Agaricus (Pluteus) cervinus Schæff. The original and plate differ greatly. The upper figure of plate is 1 in. more in diameter; the central figure is $3\frac{1}{4}$ in. wider and the section $1\frac{1}{2}$ in. wider than the plate. There are two other figures and an additional section of a young plant on the original. The small figure with a slate-coloured pileus does not exist on the original. There is a note, "Insipid earthy tast to the palate but somewhat acrid in the throat."

109. Panus stypticus Fr. There is no original of this.

110. Boletus versipellis Fr. There is no original of this.

111. Boletus regius Krom. There is a fine original of this where the pileus is $1\frac{1}{8}$ in. more in diameter, and the stem 2 in. more in height and $\frac{1}{2}$ in. more in diameter. The section is $2\frac{1}{4}$ in. taller on the drawing, and the pileus $\frac{5}{8}$ in. more across. There is a pencil sketch behind with a pileus 9 in. in diameter—very different from the $5\frac{1}{4}$ in. of plate. Fries refers this plate to *B. edulis* Bull., to which species, even in the plate, it has no resemblance. In *edulis* the gills are pallid and *nearly free*; in the plate they are yellow, and *adnate* or *slightly decurrent*. Under *regius* Fries says the tubes are "semiliberis"; but in Krombholz's own figure—t. 7—from which Fries drew up his description, the gills are really adnate, as in Sowerby's drawing. Sowerby's illustration also agrees with my

own drawing of *regius*. Sowerby says of his enlarged representation of the pores, "perceptable mag^{d}"; he also adds, "tasted pleasant when broiled but watry rather."

112. Sistotrema confluens Pers. The section on the plate is not on the original, and a pileus is added to the lower right figure.

113. Merulius lacrymans Fr. The plate is not much like the original; the latter is more yellow in colour, with the hymenium more venose than porous, and the veins do not reach the margin of the pileus as on the plate. There is an imperfect section on the original. The unnatural "tears" of the plate are an addition. There is a beautiful and highly finished original of this in the Dickson-Sowerby collection, but the pores are different and much more natural on the original than plate. There are nine realistic "tears" on this drawing, and ten on the plate; none of the latter are in like positions with the original.

122. Agaricus (Tricholoma) albellus Fr. On the original drawing of this Sowerby has written, "Ag^{s}. albellus Schæff 99 proliferus J Sowerby."

123. Agaricus (Clitocybe) dealbatus Sow. A plate made up from outlines on two drawings, one of nineteen, the original of plate; the other of seventeen specimens. There is a note, "Forms circles"; and on the back of one drawing is written, "Ag umbiliferous Lin."

124. Agaricus (Inocybe) geophyllus Sow. The colour of the left-hand figure is faintest rose-lavender in the original, not purple as on the plate; the small brown figure on right of plate is lavender in the copy.

(To be continued.)

CEPHALOZIELLA LIMPRICHTII Warnst. IN BRITAIN.

By W. E. Nicholson.

While collecting specimens of *Cephalozia* for the purpose of studying the differences between *C. byssacea* and *C. divaricata* last winter in Sussex I came upon a considerable quantity of a species which I thought might belong to the latter, but on my sending some of this material to Mr. S. M. Macvicar, he pointed out to me that my plant had a paroicous inflorescence, and did not agree with any recognized British species. He further suggested that, judging from the diagnosis given by Herr Warnstorf in his work on the hepatics and sphagna of Brandenburg, my plant seemed to agree well with *Cephaloziella Limprichtii* Warnst. Herr Warnstorf has kindly confirmed Mr. Macvicar's identification, stating that the Sussex plant, though somewhat smaller than the plant originally described, agrees well with it in all other respects. As regards size, I find the plant subject to considerable variation. In damp shady places it is more robust, and produces fewer perianths, while in more exposed situations it is more slender, and perianths are produced freely.

The following is a slightly modified translation of Herr Warnstorf's original diagnosis, to which I have added a short description of the capsule :—

Cephaloziella Limprichtii Warnst. in Kryptogamen Flora der Mark Brandenburg ; Leber- und Torf-moose von C. Warnstorf (the part containing the publication of *C. Limprichtii* appeared on the 7th June, 1902). Mesophyte ! Plant in all parts larger and more robust than *C. byssacea*, in yellowish green, loose, black patches, becoming brownish with age. Stems prostrate, over 10 mm. long, with rhizoids, simple or with subfloral branches. Leaves rather distant, larger below the female flowers, diagonally inserted on the stems, from a narrower base generally keel-shaped or trapeziform in outline, divided by a generally sharp-angled sinus reaching to about the middle into two pointed slightly or strongly diverging lobes with entire margins; the lateral margins of the lower part of the leaves without teeth. Stipules few, distinct, scattered, broadly lanceolate. Cells small, 16–20 μ in diameter, quadratic and shortly rectangular, here and there mixed with scattered irregular polygonal ones, in the younger leaves thin-walled, in the older ones and the male bracts somewhat incrassate. Paroicous ; male flowers in catkins below the female flower ; bracts larger than the stem-leaves, oval in outline, bifid by an obtuse sinus reaching from one-third to one-half of the length of the leaf ; lobes pointed and imbricate, with entire margins ; female flowers on the ends of the stems ; inner bracts twice as large as the upper stem-leaves, divided by a sharp sinus, often reaching to the middle, into two pointed lobes with the margins entire or indistinctly obtuse-toothed, sometimes adnate to the lower bract, so as to form a common envelope to the perianth, bright brown or greenish and only bleached in the extreme margins. Perianth exserted about half its length above the bracts, sometimes tinted reddish below, obtusely three- to six-angled, bleached at the somewhat narrowed lobed and crenulate mouth. Capsule small cylindrical-oblong, ·45 to ·55 mm. long and ·16 to ·21 mm. broad ; cell-walls of both the inner and outer layers of the capsule-wall strongly nodulose. Spores 9 to 12 μ in diameter, finely papillose, and like the valves and elaters of a bright claret-red when living. Mature in April. Gemmæ very similar to those of *C. byssacea* are frequently present. The Sussex plant was found on damp clay soil under trees on the fringe of the Folly Wood, Hamsey, near Lewes. Previously it had only been recorded by Herr Warnstorf from a single locality near Neuruppin in Brandenburg.

C. Limprichtii differs from *C. byssacea* (Roth) and *C. diraricata* (Smith) in its larger size, paroicous inflorescence, and entire female bracts, and from *C. Jackii* (Limp.), the only paroicous British species with which it could well be confused, in its larger size, its entire male and female bracts, which are also more deeply lobed, narrower, more acute and more closely imbricate, and in the thinner-walled and larger leaf-cells, which measure from 16 to 20 μ in diameter in *C. Limprichtii* as against 12 to 15 μ in *C. Jackii*.

SHORT NOTES.

Bryum neodamense.—While botanizing on the South Lancashire coast with Messrs. D. A. Jones, F.L.S., and E. A. Dallman, we found the ditch in which *Bryum neodamense* Itzig. was rediscovered recently had been thoroughly "cleaned," and all traces of the moss had vanished. Very fortunately we found it in fair quantity in another station near Formby, bearing a few immature capsules. As it is thirty years since fruiting specimens were last collected in Britain, the fact is perhaps worth putting on record. In the immediate vicinity *Hypnum Wilsoni* and *H. Sendneri* were also fruiting more freely than usual.—J. A. Wheldon.

Allium triquetrum in S. Devon.—In the spring of 1901, during a short stay I made at Salcombe, S. Devon, I was fortunate enough to come across *Allium triquetrum*. I fully intended revisiting the locality, and so being able to send you a fresh specimen. As it is, illness has prevented my doing so, and I can only send the enclosed, gathered in May, 1901. There was quite a large clump of it, so that I think there is no fear of its not still being there.—F. M. Ruddock.

North Devon Cryptogams.—Algæ: In September, 1903, I found on this coast *Harveyella pachyderma* Batt. parasitic on *Gracilaria confervoides* L., and *Chloreocolax Polysiphoniæ* Reinsch on *Polysiphonia elongata* Grev. This past winter I have found *Actinococcus aggregatus* Schmitz on *Gymnogongrus Griffithsiæ; Melobesia corallinæ* Solms. on *Corallina officinalis* L.; and *Sterreocolax decipiens* Schmitz on *Ahnfeltia plicata*. In each case the plants have been examined and named for me by Mr. E. M. Holmes, F.L.S. These are all new records for North Devon. In the "Catalogue of British Marine Algæ," published as a Supplement to this Journal in 1902 by Dr. Batters, no North Devon localities are given for the following Algæ: *Phyllophora epiphylla* Batt.; *P. palmelloides* J. Ag.; *Cladostephus spongiosus* C. Ag. Musci: In May, 1902, I found *Barbula gracilis* Schwægr. (*teste* Mr. H. N. Dixon) on sandhills in North Devon; a new record for Devon. Hepaticæ: In April, 1904, I found *Anthoceros punctatus* L. in fruit here, and this year specimens with gemmæ; also *A. lævis* L., with fruit as yet immature, and *Aneura multifida* L. with gemmæ.—C. E. Larter.

Spanish and Portuguese Grasses.—*Hordeum murinum* L. var. *leporinum* (Link). Lisbon.—*Andropogon hirtus* L. Cintra Lusit. Tisidabo, Catalonia.—*Avena barbata* Brot. Lisbon, Montserrat, and Algeciras.—*A. albinervis* Boiss. Badajos. Only given for the kingdom of Granada by Willkomm & Lange. Also at Algeciras.—*Festuca triflora* Desf. Montserrat, new to Catalonia; I also gathered it near Algeciras.—*Melica minuta* L. var. *major* Coss. Montserrat, Tarragona.—*M. minuta* L. Gibraltar; not given for this place by Wilkomm & Lange.—*Festuca spadicea* L. var. *Durandii* Hack. Cintra, not given for Portugal by Wilkomm & Lange or Nyman. Montserrat, Catalonia.—*Schismus calycinus* Duval-Jouve. I gathered this grass amid the ruins of Timgad, in Algeria; it is

only recorded from Biskra by Battandier & Trabut. I am indebted to Prof. Hackel for the names of the grasses—G. Claridge Druce.

Holosteum umbellatum L. in Surrey. — Early in April of this year, through the kindness of Mrs. Davey, of Cuckfield, I was sent a fresh specimen of *Holosteum umbellatum*, which had been gathered in Surrey by Miss Cardew, a young and enthusiastic botanist; on asking for further particulars, I was enabled to see the plant *in situ*. For reasons only too obvious, it will be enough to state that it exists in fair quantity on old walls and in a field near by, in the westerly portion of the county. I have every reason to believe that the plant is native in this locality; in the sandy pasture where it grew it was associated with such plants as *Erophila*, *Erodium*, *Myosotis collina*, *Saxifraga tridactylites*, *Vicia lathyroides* (sparingly), and various *Cerastia*. Watson's Top. Bot. entirely ignores *H. umbellatum* (presumably on account of its predilection for walls); but the *London Catalogue* includes it without any mark of suspicion, with a census of 3. Mr. Arthur Bennett tells me that these are—
25. Suffolk E. First notice, Eye, 1836; last, Hoxne Abbey, 1889.
26. Suffolk W. First notice, Bury, 1773; last, Bury, 1855.
27. Norfolk E. First notice, Norwich, 1765 (first record also for England); last, Norwich, 1880. All the records, except one, seem to refer to walls and roofs only as the spots on which *H. umbellatum* grew; but it is interesting to note, in the face of its occurrence in a sandy pasture in Surrey, that Mr. John Pitchford, who was its first discoverer in England, said it occurred on old walls, banks, and sandy cornfields about Norwich. I do not think *H. umbellatum* has lately been found in either Suffolk or Norfolk, but it may yet survive on some of the walls of private gardens in Norwich or elsewhere. It may perhaps be overlooked in other suitable localities, as it flowers extremely early—it was almost over when I saw it on April 29—and is soon burnt up and disappears. It is widely distributed in Europe—France, Belgium, S. Sweden, Denmark, Germany, Spain, &c.—and there is nothing to hinder one from including it as a native of the British Isles; Richter (Pl. Europ. 1899) includes England in the list, without comment. In many parts of France it is not uncommon in sandy and stony places, vineyards, and on walls.—C. E. Salmon.

Mentha pratensis Sole. — The note on this in the *Flora of Hampshire* (ed. 2, 296) is somewhat misleading. The sentence attributed to Syme is really part of that quoted by him from Sole, which runs: "I found this plant in the year 1789, in wet places in the New Forest, Hants, particularly in a common (Alderbury common) near the Roebuck, between Salisbury and Romsey" (Sole, *Menthæ Britannicæ*, 49). In the copy in the library of the National Herbarium, A. B. Lambert (to whom it belonged) has corrected "Alderbury common" to "Shervile common," and has added the following note: "This common I examined in the year 1798 & was shewn by the person who keeps the Roebuck the spot where Mr. Sole found the plant which was nothing more than a plant of

Mentha rubra thrown out of the Roebuck garden. A. B. L." Six of Sole's letters are bound up with the volume.—James Britten.

Senecio squalidus in Worcester.—In Lees's *Botany of Worcestershire* this plant is recorded as growing on an old wall near the Priory Ferry. At this station it has been extinct for some years, but it is now growing in some profusion both by the side of the Virgin Tavern Road and near the top of the tunnel in Worcester.—Carleton Rea.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on the 4th of May, a paper by Mr. R. N. Rudmose-Brown on "The Botany of Gough Island" was read. Gough Island, or Diego Alvarez, lies in the mid South Atlantic, lat. 40° 20′ S., long. 9° 56′ 30″ W., and may be regarded as the most outlying member of the Tristan da Cunha group, a small island between seven and eight miles long, and half as wide, rising to a height of 4000 ft. It has been occasionally visited, but never permanently inhabited. The chief features of the vegetation are the tree *Phylica nitida* and the tree-fern *Lomaria Boryana*. Four of the seventeen species of phanerogams are almost certainly introduced, while two are new to science—a species of *Cotula* and an *Asplenium*. The Scottish Antarctic Expedition lay off the island for three days in April, 1904; but, owing to high seas, landing was only practicable on one day, when the materials for the present paper were collected.

At the same meeting a paper was read by Prof. A. G. Tansley, entitled "The Study of Vegetation: its present condition and probable development." The word Œcology, introduced by Prof. Häckel, means the study of the vital relations of organisms to their environment, and by Prof. E. Ray Lankester was termed Bionomics. Restricting his remarks to a special branch of the subject, the author proceeded to consider the plant-association as the unit, the great fact being the association of plants under definite conditions of environment. Instances were given of sets of plants found in meadows, woods, cultivated fields, moors, and dunes. The actual subject is not new, but the publication of Prof. Warming's *Plantesamfund* in 1895, translated into German the following year as *Lehrbuch der Ekologischen Pflanzengeographie*, made it for the first time possible to estimate what has been done, and how much remained to be done. It was in this volume that the importance of the plant-association as the unit was first brought clearly into view. A plant-association may be defined as the smallest aggregation of individuals belonging to one or more species living under definite conditions; a plant-formation is an aggregate of a higher order, usually including many associations and determined by more general conditions. These may be studied in many ways. Thus, the detailed study of the unit; the species forming it, and the causes enabling them to maintain their position; its phylogeny.

Then the same methods with regard to the plant-formations, classed into groups and still larger aggregates. For these, help must be drawn from various quarters, anatomical and physiological research, the physical conditions, the meteorology and geology of the localities studied, and the experience of foresters and cultivators utilized. These may be plotted on maps of appropriate size, in colours or symbols, thus constituting Phytotopography. Considerable progress has been made with a "primary analysis" of the plant-formations of Great Britain by these surveys; the initiation of this work was due to the late Robert Smith, of St. Andrews, and since his death it has been carried on by his brother, Dr. William Smith: Northumbria and Scotland are well advanced. Cultivation has naturally interfered with the wild plants; but man's power is limited, and the plants he cultivates must also be taken into account. Thus in the northern districts, the upper limit of wheat-cultivation is an important piece of information, and where wheat is stopped, oats can succeed. When conditions have been altered by drainage, grazing, or the like, these must be investigated, however complicated.

"WHERE is the Kew Bulletin?" is the title of a letter in the *Times* of May 2, to which, so far as we have seen, no answer has been vouchsafed. The writer, who signs himself "Botanist," considers that "the interests concerned have felt no small loss by the discontinuance of the *Bulletin*"; he might have quoted in support of his contention the words of the *Times* itself, which in a leading article on March 22, 1892, said: "No reasonable man can doubt that the publication of the *Bulletin* is one of the most useful functions discharged by the Royal Gardens." Commenting on this, we presumed to say (Journ. Bot. 1892, 126): "The enthusiastic leader-writer protests too much when he tries to make folk believe that the *Bulletin* is essential either to the interests of Kew or to the interests of science"; and this is obvious, for no volume has been published since the incomplete issue of 1901, while both Kew and science have survived the deprivation. "Botanist," by the way, is in error in saying that the *Bulletin* "has not been published since 1898, saving an odd volume in 1899"—rather an odd way of putting it: three issues, each including three months, appeared in 1901, with a promise of that for 1900. At the end of that year, the Director of Kew Gardens, in his evidence before the Committee on Botanical Work (p. 79), said: "The *Bulletin* remains a continuous record of Kew work in all its aspects," and (p. 98) that it was edited by himself. "Botanist" says: "I have heard it related that the officials concerned religiously accumulated the matter that should have been published month by month for years, but it was never utilized." In view of the interest which evidently attaches to the *Bulletin* and of the importance which attaches to a knowledge of the actual as distinguished from the ostensible dates of its publication, we propose at an early date to make it the subject of one of our "Bibliographical Notes." Meanwhile possibly "Botanist" might be able to obtain from Parliament, at whose instance it was established, "an answer to the question why the precious *Kew Bulletin* is no longer issued."

Sir Hugh Low, who died at Alassio in April, was born at Clapton, 10 May, 1824. His name is associated with some of the most remarkable plants of Borneo, to which he paid his first visit at the age of nineteen. Here he became acquainted with Mr. (afterwards Sir) James Brooke, with whom he was afterwards intimately associated. The species of *Nepenthes* collected by him on Kina Balu in 1851 form the subject of a paper by Sir Joseph Hooker in Trans. Linn. Soc. xxii.; one (*N. Lowii*) bears his name, which is also commemorated in *Vanda Lowii* and *Cypripedium Lowii*. He administered the government of Labuan for twenty-five years, and in 1877 was appointed Resident at Perak, a post which he held until his retirement in 1889. He was created K.C.M.G. in 1883, and became a Fellow of the Linnean Society in 1894.

The death is announced of John Horne, who went out from Kew to the Botanic Gardens, Mauritius, in 1860. In 1871 and 1874 he visited the Seychelles; his collections went to Kew, and are taken up in Mr. J. G. Baker's *Flora of Mauritius*, wherein he is commemorated in *Ipomæa Hornei*. His visit to Fiji in 1877 formed the subject of a volume, *A Year in Fiji* (1881), noticed in this Journal for 1882 (p. 27), in which a large number of *nomina nuda* for supposed new species are published; the ferns, which were described by Mr. Baker in this Journal for 1879 (p. 292), include *Alsophila Hornei*. Horne became Director of the Mauritius Gardens in 1877, and resigned the post in 1892 on account of ill health. He subsequently lived at St. Clements, Jersey. He became a Fellow of the Linnean Society in 1873.

The new edition of the excellent *Flora der Schweiz*, by Prof. Hans Schinz and Dr. R. Keller (Raustein, Zürich) is to be in two parts, of which the first, the "Exkursionsflora," is before us. It is an extremely handy volume, admirably adapted for a companion in the field, although numbering over 600 pages, being convenient in size and clearly printed on thin but good paper. The only drawback to its usefulness—not for those for whom it is intended, but for English botanists—is that it is written in German; we are inclined to think that an English translation would be worth undertaking, although perhaps the English edition of the invaluable "Gremli" supplies what is needed.

The recent issues of the Notes from the Edinburgh Botanic Garden are mainly occupied with an account of George Don and his work, by Mr. G. C. Druce, of which we shall have more to say later on.

We learn from the *Daily News* of May 16 that, "Speaking at the Royal Institution on Saturday on 'Fungi' Professor Ward said there was a mould called 'lurking fungi.' These generally attacked grain, and, in a way, went to sleep between the seed and its husk. They were poisonous, and had caused epidemics in the past. It was his belief that beri-beri was caused solely by a 'lurking fungi' in the rice." The *Westminster Gazette* of the following day, writing of Connemara, says, "not alone fuchsias gladden the heart of this spot so favoured by nature. *Other wild flowers* in their due season are to be found in abundance, some most rare."

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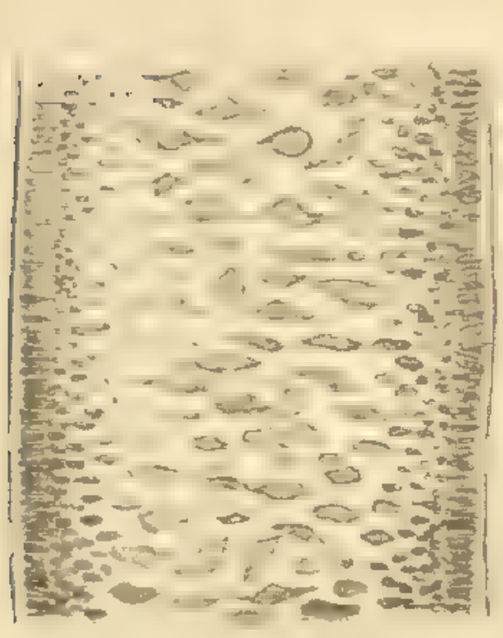

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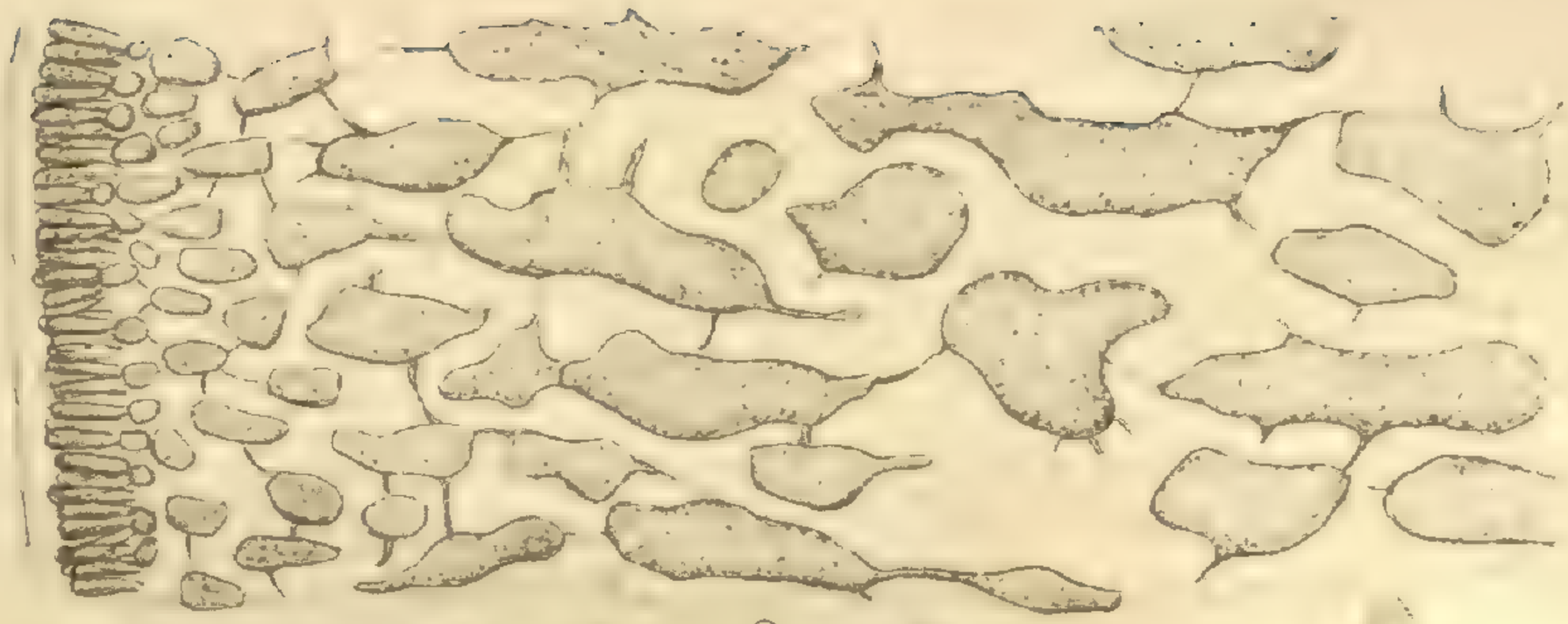

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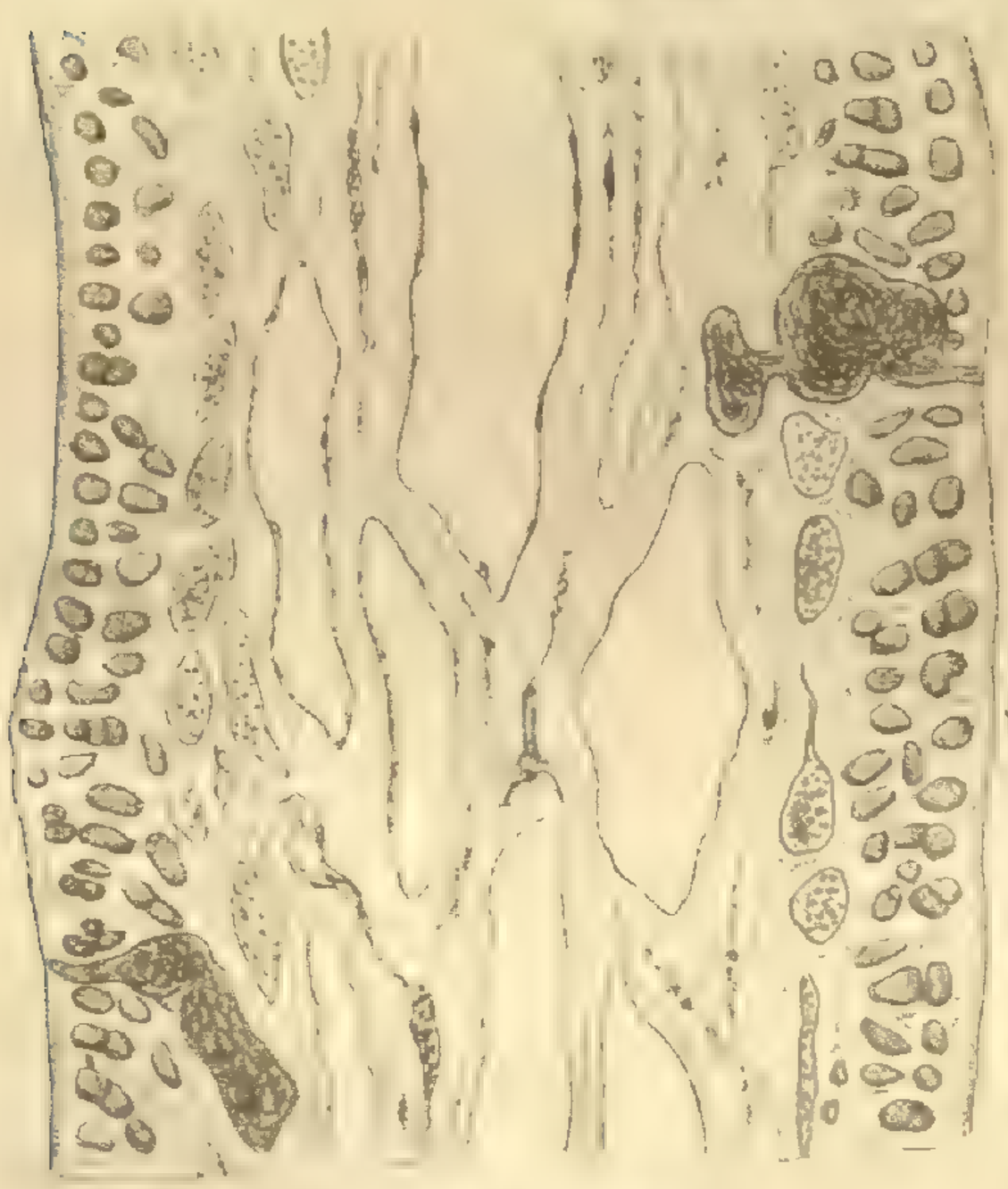

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Antarctic Algæ.

MORE ANTARCTIC ALGÆ.*

By A. & E. S. Gepp.

(Plate 472.)

Since the publication of our paper on the Antarctic Algæ collected by the Scottish National Antarctic Expedition at the South Orkney Islands (Journ. Bot. 1905, 105–109), we have received from Mr. R. N. Rudmose Brown a few more specimens, which he had previously overlooked among other collections, and which were not discovered until the final clearing of the 'Scotia' preparatory to her sale. That they were not sent to us with the first batch is unfortunate; for among them is a sporangiferous specimen which shows that the sterile plant which we described as *Leptosarca simplex* must be transferred to *Gracilaria*, of which it might well form a new section. There is also a new species closely allied to *Delesseria sanguinea*, but at once distinguished from it by the appendages which adorn the cystocarp. Two other specimens are sterile, and one of them we have quite failed to identify from its structure and form, though we have compared it widely with the extensive collection of microscope-preparations in the British Museum.

All six specimens are reported as having been collected at a depth of 9–10 fathoms.

1. Wildermannia laciniata De Toni (= *Porphyra laciniata* Ag.). Buchan Bay, South Orkneys, March 25, 1903.

Geogr. Distr. Mediterranean, North Atlantic, South Georgia, Scotia Bay, South Orkneys.

2. Floridea. Frons cartilaginea plana, 23 cm. lata, irregulariter lacerata et fenestrata lævis, stratis duobus contexta; cellulis interioribus majusculis (35–70 μ long., 15–25 μ lat.) irregularibus rotundato-angulatis vel plus minusve axin versus perpendiculariter elongatis sparsis cartilagine hyalina immersis hic illic filamento tenui inter se conjunctis; cellulis subcorticalibus minoribus paucis rotundatis, corticalibus elongatis angustis (20–25 $\mu \times 4\ \mu$) congestis monostromaticis; omnibus protoplasmate granuloso instructis.

Scotia Bay, South Orkneys, March 25, 1903.

This specimen consists of a broad thickish cartilaginous frond, recalling *Iridæa*, much rent and irregular in outline, about 23 cm. in length and width. No point of attachment is to be distinguished, and the thallus is ragged and slit at the margin and in the body of the frond—something like Kützing's figure of *Iridæa cornea* (Tab. Phyc. xvii. t. 20). Neither cystocarps nor tetraspores are present.

---

* This paper, with that on "Antarctic Algæ" by the same authors, completes the list of the higher marine algæ collected by me at the South Orkneys, with the exception of a few species enumerated in the accompanying paper by Mr. E. M. Holmes. The algæ which Mr. and Mrs. Gepp have kindly described for me in the present paper were overlooked among the mass of collections on the 'Scotia,' and only recovered when the former paper was in the press. Many unicellular algæ—fresh and marine—were collected, but are not yet fully determined, and will be published later.—R. N. Rudmose Brown.

The surface is smooth, and in some parts the cortex has been eroded, but in others it is quite uninjured. In transverse sections the interior of the thallus is seen to be composed of fairly large irregular cells, rotundato-angulate or elongated more or less perpendicularly to the surface, spaced out and embedded in a hyaline cartilaginous matrix. All the cells are lined with a granular protoplasm, and here and there show distinct thin strands of protoplasm from cell to cell. This broad interior tissue forms the greater part of the thallus, and is bordered on either side by a thin band of much smaller round cells, closer together and abutting on the cortex. The cortex is composed of a row of long, narrow, closely-packed vertical cells. There is no medullary stratum of filaments.

In attempting to determine the systematic position of this plant, we have examined innumerable microscopic preparations of various genera without finding any structure resembling that of our plant. The total absence of a filamentous medulla prevents it from being placed in *Kallymenia* or *Euhymenia*, which otherwise it somewhat resembles. We are very much puzzled by Reinsch's *Kallymenia reniformis* f. *carnosa* (Meeresalgenfl. v. Süd Georgien, p. 394), the medullary parenchyma of which he describes as a homogeneous tissue of larger cells with wider lumen than in *K. reniformis*, and packed with starchy contents. He gives no figure, and his description is too incomplete to enable us to decide whether, or how far, his plant approaches ours. He states that his plant has a very different structure from typical *K. reniformis*, except for its cortex. Our plant differs from *K. reniformis* in having its cortical cells vertically elongate, and not rotundate; and its interior cells often elongate perpendicularly, and not parallel to the surface of the frond. Though unable to indicate the genus to which this 'Scotia' specimen belongs, we record our observations in the hope that fertile material gathered by one of the other Antarctic Expeditions may give the clue to its identity.

3. Callophyllis variegata Kütz.? Scotia Bay, South Orkneys, July, 1903.

Geogr. Distr. S.E. Pacific, New Guinea, Kerguelen, Auckland Islands, and Straits of Magellan.

This is a sterile and incomplete plant, and consequently we are unable to determine it with certainty. Its structure, as seen in a transverse section of an older part of the frond, much resembles that of *Callophyllis variegata*. The thallus is composed of two strata, the interior consisting of large, thick-walled cells, separated from one another by smaller flexuose tubular cells, and passing into a cortex of small round cells, laxly and irregularly arranged in a cartilaginous matrix. The cortex is here and there invaded by a green endophyte, probably *Chlorochytrium*. In younger parts of the frond the cortex is monostromatic, and the interior has a fibrous appearance, owing to the collapse of the cells. As to the habit of the plant, the base is absent, and the fragment of thallus which we have is more or less palmately lobate and irregularly proliferous, membranaceous in texture, and coccineo-rosaceous in colour. The specimen is 7 cm. high and 9 cm. wide.

C. variegata is of common occurrence about Cape Horn and the Falkland Islands, and our plant may be one of its broader forms.

4. GRACILARIA SIMPLEX nob. (*Leptosarca simplex* nob. in Journ. Bot. 1905, pp. 108, 162). Scotia Bay, South Orkneys, June, 1903.

It is a great satisfaction to us to have received further and better-developed material of this plant. Our previous opinion of its systematic rank and affinities was founded on a study of sterile fronds only; but now that we have had an opportunity of seeing the tetraspores and of examining the structure of the sporangiferous fronds, we have come to the conclusion that the species is not merely related closely to *Gracilaria*, but ought to be included in that genus, at least until the question can be finally settled by the finding of the cystocarps. It is difficult to fit *G. simplex* into any recognized section of *Gracilaria*; and, though we believe that it deserves a new section, we leave it for the time being in J. G. Agardh's section *Podeum*, next to *G. Curtissiæ*, an American species which resembles our plant in having its frond membranaceous and broad, though not simple. In *G. simplex* the structure of the sterile frond is markedly different from that of the fertile. In the sterile frond the cortex is monostromatic, and the interior cells are few, large, and very thin-walled; this is what we described as *Leptosarca* (*loc. cit.*). The fertile frond, on the other hand, has a cortex of short chains of cells, slightly branched, and arranged perpendicularly to the surface; among these occur the large cruciately divided tetraspores; and the interior cells are thick-walled, smaller, and more numerous than in the sterile frond. Had the two sorts of frond not been found on the same plant, we should have hesitated to regard them as belonging to one and the same species.

We would add the following description of the sporiferous plant:—Frondes plures (8–10) e callo minuto ortæ simplices oblongæ vel lato-cuneatæ planæ membranaceæ, 10–15 cm. longæ (apice destructo), 3–8 cm. latæ, c. 230 μ crassæ, inferne in stipitem plus minusve sensim angustatum, 1–3 cm. longum attenuatæ, stratis duobus contextæ cellulis interioribus rotundato-angulatis magnis 2–3-seriatis pachydermis (frondis sterilis majoribus maxime leptodermis collabentibus submonostromaticis); cellulis corticalibus filamenta ramosa verticalia efficientibus, tetrasporangia magna cruciatim divisa foventibus (frondis sterilis majoribus monostromaticis).

5. **Hydrolapathum stephanocarpum**, n. sp. Frons fruticulosa 15–30 cm. alta irregulariter dichotoma 3–4 mm. lata valde costata alata, ala pinnativenia sæpe destructa, prolificationes numerosas lanceolato-lineares costatas pinnativenias, venis oppositis conspicuis, monostromaticas usque ad 32 mm. longas et 4 mm. latas, e costis emittens. Cystocarpia adparenter pedicellata, revera in foliolis minutis transformatis e costa emergentibus sessilia, trichomatibus pluribus instructa.

Hab. Scotia Bay, South Orkneys, July, 1903.

This species is most nearly related to *Delesseria sanguinea* Lam., from which it differs in having the cystocarps not smooth, but more or less clothed with simple tapering appendages, chiefly disposed around the sides, and leaving the top bare. But for this wreath of

appendages we should regard the plant as no more than an old narrow-leaved and very proliferous form of *D. sanguinea*.

The question whether or not *H. stephanocarpum* belongs rightly to the genus *Delesseria* depends on the view held of the systematic position of *D. sanguinea* (= *Hydrolapathum sanguineum* J. Ag.), with which species our plant must stand or fall. Agardh, attaching primary importance to the structure of the *mature* fruit, regarded *Hydrolapathum* as forming a distinct genus in *Rhodymeniaceæ* near *Rhodophyllis*, on account of its composite cystocarp with "nucleoli" separated by radiating columns of sterile threads, and on account of the carpostomium-structure. Schmitz, on the other hand, reunited *Hydrolapathum* with *Delesseria* on account of the similarity of procarpial development, which is a more primitive character than the mature fruit on which Agardh founded his conclusions. If we follow Schmitz and De Toni, our plant would be called *Delesseria stephanocarpa*. Our own inclination is, however, to follow a middle course. Instead of sinking *Hydrolapathum* into *Delesseria*, from which so many less well-marked genera have been quarried, we would maintain *Hydrolapathum* as an independent genus on the score of the structure of its cystocarps and sporophylls; but we would place it in the *Delesserieæ*, and not in *Rhodymeniaceæ*.

6. Pteronia pectinata Schmitz. Scotia Bay, South Orkneys, July, 1903.

Geogr. Distr. Cape Horn, Falklands, and South Georgia.

This species was recorded in our paper on "Antarctic Algæ" (*l.c.* p. 107). The present specimen was growing attached to *Hydrolapathum stephanocarpum*.

Explanation of Plate 472.

Floridea. — Fig. 1. Transverse section of thallus, × 44. Fig. 2. Portion of same, showing cortex and interior cells, × 288.

Callophyllis variegata ? — Fig. 3. Transverse section of thallus, showing endophyte, × 288.

Gracilaria simplex. — Fig. 4. Transverse section of fertile frond, showing tetrasporangia, × 288.

Hydrolapathum stephanocarpum. — Fig. 5. Portion of plant, nat. size. Fig. 6. Cystocarp, × 30. Fig. 7. Section of cystocarp sessile on sporophyll, × 30.

SOME SOUTH ORKNEY ALGÆ.

By E. M. Holmes, F.L.S.

The following list* comprises the calcareous algæ submitted to me for identification by Mr. R. N. Rudmose Brown, and, in addition, some fragmentary algæ found adhering to these. The specimens were all collected at the South Orkneys during the stay of the

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* To this list of calcareous and other algæ, which Mr. E. M. Holmes has kindly drawn up for me, I have added some notes on the distribution of the species. I have omitted a few species, also recorded in the lists of Mr. and Mrs. Gepp.—R. N. Rudmose Brown.

Scottish National Antarctic Expedition there from March to November, 1903:—

Prasiola crispa Ag.* Sp. Alg. p. 146; Kütz. Tab. Phyc. v. t. 40, f. vi.; De Toni, Syll. Alg. i. p. 142. Saddle Island; Scotia Bay; Ferrier Peninsula, &c.

Very common on rocks up to several hundred feet, wherever there is running water in spring.

The species is cosmopolitan in distribution, including Graham's Land and Cockburn Island, Antarctica.

Scytothamnus rugulosus De Toni, Syll. Alg. iii. p. 454. Scotia Bay, April, 1903; 9–10 fathoms.

Also recorded from the Magellan Straits and Falkland Islands.

Cryptonemia luxurians J. Ag. Sp. Alg. ii. p. 228. Scotia Bay, April, 1903; 9–10 fathoms.

The undulate margin and parchment-like consistence of this fragmentary specimen indicate that it belongs to the above species. It is recorded from South Polar Regions by J. G. Agardh from Montagne's specimens collected in the "Voyage au Pole Sud"; but Hariot failed to trace it in Montagne's herbarium, and found only *Delesseria Lyallii* Harv. It is therefore interesting to ascertain that the plant really does occur in the Antarctic Ocean.

Distributed in the Canary Islands, Cape Verde Islands, Brazil, and Martinique.

Iridea sp. Scotia Bay. Minute cuneate fronds of about 1 cm. long occur on the stones received, in company with the *Lithothamnia*, but it is impossible to determine to which of the species known to occur in the Antarctic Ocean this plant belongs.

Plocamium secundatum Kütz. Tab. Phyc. xvi. t. 42. Scotia Bay, April, 1903; 9–10 fathoms.

The specimens do not exceed 2 cm. in length, and occur on the stones bearing the *Lithothamnia*; but there is no reason to doubt that they belong to this species.

Also recorded from Cape Horn, Hermite Island, and Magellan Straits.

Petrocelis cruenta J. Ag. Sp. ii. p. 490; Crouan, Fl. Finist. p. 147, t. 18, f. 122. Scotia Bay, 9–10 fathoms.

This species occurs on the stones bearing the *Lithothamnia*. Although it is not in fructification, the absence of the zonate lines found in *P. Middendorffii* Kjellm. and the thin basal portion of the thallus indicate *P. cruenta* J. Ag.

It does not appear to have been previously recorded from the Antarctic Ocean. Known from Europe and North America.

Lithothamnion lichenoides Heydr. f. *antarctica* Fosl.? List of Sp. (1898), p. 7; Svenska Exped. till Magell. Bd. iii. No. 4, p. 70. *L. antarcticum* Heydr. Lith. Mus. Paris (1901), p. 544. Scotia Bay, June, 1903.

Distribution.—Hermite Island, Falkland Islands, and Kerguelen.

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* This species was determined by Mr. A. D. Cotton.—R. N. R. B.

L. magellanicum Foslie, f. *crenulata* Fosl. in Kgl. Norske Vidensk. Sels. (1904), New Calcareous Algæ, p. 3; *op. cit.* 1895, p. 8, fig. 8. Scotia Bay, 9–20 fathoms, July, 1903.

This plant is mixed with the two following on the same stones, but is the least abundant of the three. It differs from the type in having a zonate margin and irregular very shallow prominences on the surface as in *L. fecundum*, but the surface is less shining than in that species.

Lithophyllum discoideum Foslie, f. *æquabilis* Fosl. in Kgl. Norske Vidensk. Sels. (1904), p. 3; Svensk. Exp. Magellansländerna, Bd. iii. No. 4 (1900), p. 73. Scotia Bay, 9–10 fathoms.

This plant has a smooth discoid thallus, with the immersed receptacles visible, only when empty, as a number of circular depressions crowded on the central half of the thallus. The margin is minutely cracked or fissured, as in *L. incrustans* Fosl.

L. decipiens Fosl. in Svenska Exped. till Magell. Bd. iii. No. 4 (1900), p. 71. Scotia Bay, 9–10 fathoms.

These specimens are in bad condition, all the sporangia being empty; they are crowded closely over the whole surface of the thallus, giving it a rough or minutely reticulated appearance.

Distribution.—California and Fuegia.

It is remarkable that *L. rugosum* Fosl., which occurs with *L. magellanicum* and *L. discoideum* on the coast of Patagonia, does not occur on any of the stones from the South Orkneys. It is characterized by the prominent wart-like excrescences on the thallus, like those of *L. colliculosum* Fosl., from which it differs in the character of the sporangia.

FRENCH AND GERMAN VIEWS OF BRITISH RUBI.

By W. Moyle Rogers, F.L.S., and E. F. Linton, M.A.

The Rev. E. S. Marshall has done a signal service to British batologists in giving so clear a *résumé* (p. 73) of Dr. Focke's monograph of the Central European Rubi in Ascherson & Graebner's *Synopsis*, and detailing the changes there made, in nomenclature or classification, which affect our British list. It is undoubtedly disappointing that Dr. Focke should, contrary to his prevailing views in 1890, and in several succeeding years, consider these changes desirable. For it must be remembered that far the greater number of the names, which it is now demanded that we should exchange for others, were either in the first instance suggested by him, or else were endorsed by him, and not infrequently more than once. In the following discussion of the species and varieties in question we hope to show that most of these changes are undesirable, at all events at present; the more so, as by Dr. Focke's own admission his new arrangement is to a great extent provisional only, if we rightly understand the unsettling postscriptive statement at the end of Mr. Marshall's paper.

Almost simultaneously with this notice of Dr. Focke's recent work has come to our knowledge a French statement of views of British brambles, in some *Observations sur Set of British Rubi* (Angers, 1904), by Prof. H. Sudre, who is engaged in issuing a *Batotheca Europæa* of considerable importance, the second fascicle of which (Nos. 51–100) reached us not long ago. Though we cannot in this paper detail all his criticisms, &c., on our plants, it will be convenient to reproduce some of his views, especially when they have some bearing on the name or position of any which Dr. Focke has called in question.

The order of the species here discussed is that of the *Handbook of British Rubi*.

R. Rogersii Linton, now referred to *R. ammobius* Focke. Previously to 1894 Dr. Focke referred this plant to *R. opacus* Focke; on Devon specimens he commented, "A curious form, intermediate between *R. plicatus*, *nitidus*, and *opacus*"; and in 1895 he wrote that he had seen no *R. ammobius* from Britain, though this name had been suggested to him. Not to repeat more of what has been related in Mr. Marshall's paper, we would say first that the new description is a considerable expansion of that in the *Synopsis R. G.*; and that the characters now added are precisely those which help to distinguish *R. Rogersii* from *R. plicatus* or allied forms; "prickles slightly recurved," "petioles with strong prickles," "leaflets very finely, sharply . . . toothed," "inflorescence more leafy"—these are some of the additions. If, however, we accept Dr. Focke's description of *R. ammobius*, as translated by Mr. Marshall, *R. Rogersii* may still be distinguished from it by the strongly angular or even sulcate stem, dark purplish in exposure, glandular, and very prickly; prickles much less curved, less equal, and not all confined to the angles; leaflets not imbricate when mature, evenly toothed, terminal leaflet not "broadly cordate-ovate," but remarkably elongate, narrower in proportion than in *R. plicatus*, and with an attenuate tip. Panicle weaker (like *R. fissus*), with shorter, stouter prickles.

Unfortunately we have never seen *R. ammobius*, having asked for specimens in vain. M. Sudre has detected the resemblance between *R. Rogersii* and *R. affinis*, under which he would place it, a likeness referred to in the original description (Journ. Bot. 1894, 213). In fact, *R. Rogersii* differs in this direction from *R. plicatus* much more than the description of *R. ammobius* would lead anyone to suppose. For the present, at all events, it seems best to leave *R. Rogersii* in our list, until we may be in a better position to judge what its proper relation to *R. ammobius* is.

R. hemistemon. We followed Dr. Focke in regarding our British plant as *R. hemistemon* P. J. Muell., the name which he gave us for specimens from Surrey and Caithness, submitted to him. With his consent, if not by his advice, our plant was ten years ago placed under *R. plicatus* as var. *hemistemon* P. J. Muell. (Journ. Bot. 1895, 47, and Lond. Cat. ed. 9), an arrangement reproduced in the Handb. Brit. Rubi. Is there any need to change

the varietal name? If it is not Mueller's plant, it is at any rate the plant of Rogers, and possibly, as Dr. Focke says, of Genevier (but see Rouy & Camus, Fl. Fr. vi. 39).

R. HOLERYTHROS Focke. M. Sudre says of our Barnacle Common plant (Set of Brit. Rubi, No. 77), "Ce n'est pas la plante que Genevier appelait *R. nitidus* et à laquelle M. Focke a donné le nom de *R. holerythros*." It happens that Dr. Focke saw and took specimens of the Barnacle Common plant, and gave us the name *R. holerythros* for the very plant (No. 77) which we issued. This, too, among others formed the basis of the description published by one of us in Journ. Bot. 1895, 47. There is a specimen in *Batotheca Europæa* (fasc. ii. No. 52), labelled *R. nitidus* W. & N. subsp. *holerythros* Focke (*R. nitidus* Genev.), which we saw at a glance was not the *R. holerythros* which Dr. Focke so named for us; nor is it M. Clavaud's plant from the Gironde, which we have from M. Clavaud himself, and which is identical with ours. It rather recalls *R. Briggsianus* Rogers, which, occurring in Guernsey and Jersey, is not unlikely to be found in North-west France, whence No. 52 comes.

R. IMBRICATUS Hort. M. Sudre has issued in the *Batotheca Europæa* (fasc. ii. No. 62), this species from Vendée, very poorly represented, but still apparently the right plant.

R. INCURVATUS Bab. Commenting on the difference between the Llanberis and Shirley representatives of this species (Set of Brit. Rubi, No. 7), which we purposely issued as the type and a variant form, M. Sudre kindly allows that the former may be the true plant: "La localité de Llanberis étant citée par Babington (Brit. Rubi, p. 90), il est possible que cette plante soit le véritable *R. incurvatus*!" Llanberis is of course the headquarters of this distinct species.

R. ERYTHRINUS Genev., identified with *R. argenteus* W. & N. by Dr. Focke. As we owed the name to Dr. Focke, by whose request the late Mr. Archer Briggs wrote his account of it (Journ. Bot. 1890, 204) as a British plant, we must not complain of his withdrawing it. From the first he expressed some doubt whether these two were distinct. It is, however, undoubtedly the case that we have two forms nearly resembling one another—a more glandular form which agrees more precisely with *R. argenteus* (Set of Brit. Rubi, No. 58), and an eglandular form, which we have called *R. erythrinus* (Set of Brit. Rubi, Nos. 6, excluding specimens from Baillie Gate, and 108). The French view is against this latter being *R. erythrinus* Genev., and equally adverse to Dr. Focke's identification of it with *R. argenteus*; for M. Boulay places it as a mere variety of *R. silvaticus* W. & N. We therefore give up *R. erythrinus* Genev. as a British plant.

R. DURESCENS W. R. Linton. M. Sudre, having seen the sheet (No. 57) in one Set of Brit. Rubi, ventures the following conjecture:—"Plante peu fertile, tenant à la fois du *R. Questieri* Lef. & M. par ses turions glabres et du *R. calvatus* Blox. par son inflorescence plus lâche et plus poilue. Vraisemblablement

R. calvatus × *Questieri*." Such hazardous shots do more injury to the critic's reputation than to the bramble's specific character. *R. Questieri* is not known for Derbyshire, or any of the adjoining counties. To anyone who has seen *R. durescens* growing, as we have done, over a wide stretch of country in South Derbyshire and North Leicestershire, and as a rule fruiting freely, and known by experiment to come true from seed, the suggestion of a hybrid origin does not appear a happy one.

R. Selmeri Lindeb. We should readily agree to restore this to specific rank, which we have hesitated doing before, chiefly because Dr. Focke so long ranged it with *R. calvatus* Blox., and spoke of that as being identical with a *R. villicaulis* form of North Germany. But it has to be remembered that under the name *R. calvatus* he included the two very different plants which we distinguish as *R. calvatus* and *R. Selmeri*. M. Sudre also considers that this plant (Set, No. 80) does not belong to *R. villicaulis* Koehl.; but it does not appear to be known for France.

R. argentatus P. J. Muell. Dr. Focke replaces *R. argentatus* P. J. M. by *R. Godroni* Lec. & Lam., 1847 ("in part?"), wherein he is following M. Boulay (Rouy & C. Fl. Fr. vi. 70), who places *R. Godroni* as a form under one of the six subspecies, which he allocates to *R. hedycarpus* Focke, with *R. argentatus* P. J. M. as a synonym. M. Boulay and Dr. Focke thus concurring, we see no sufficient reason to differ.

R. orthoclados A. Ley (non Boulay). Dr. Focke rather unceremoniously renames this *R. euchloos*, on the ground that Mr. Ley's name was already used by Boulay. M. Boulay's name is, however, defunct, he having himself identified his *R. orthoclados* with *R. anoplostachys* P. J. Muell., published eight years previously (*cf.* Rouy & C. Fl. Fr. vi. 122); and, as M. Sudre remarks (*Batotheca Europæa*, fasc. ii. No. 56) on the issue of Belgian specimens, Mr. Ley's name can perhaps be preserved. In England this singular species has as yet been certainly found only in West Gloster and Monmouth, though there are forms in Worcestershire, Cheshire, and Merioneth, which are not very easily distinguished from it. On the Continent it occurs in the province of Namur, Belgium, where it was discovered in 1898 by M. F. Gravet.

R. mollissimus Rogers. We see no reason for removing *R. danicus* Focke and *R. mollissimus* Rogers from their position in our list as varieties of *R. hirtifolius* M. & W. This was the place chosen for his *R. danicus* by Dr. Focke in 1896; and we can feel no doubt as to the close connection with it of our *R. mollissimus*.

R. Banningii Focke. It is very doubtful if we have the typical plant. Dr. Focke placed two Norfolk plants near his *R. Banningii*—one from Beeston St. Andrew, a form with hairy stem ("near *R. Gelertii* K. Frid. and my *R. Banningii*, but not identical with either of these allied forms" (B. E. C. Rpt. 1888, 211)); the other a more glabrous plant from the north-east angle of Mousehold Heath, which we have considered rather to be *R. Gelertii* Frid. Neither is quite identical with *R. Banningii*, *teste* Focke and

his description in Syn. R. G., nor are they identical with one another.

R. MICANS Gren. & Godr. This naming, due to Dr. Focke, must now, as he admits, be withdrawn, and our plant bear the name of *R. hypoleucus* Lef. & Muell. (non Vest.). It was an unfortunate move when *R. adscitus* Genev., which is exactly our plant, though not the earliest name, was replaced by *R. micans* G. & G., which M. Boulay (Rouy & C. Fl. Fr. vi. 465) says corresponds to *R. Schummelii* Weihe, a very different plant. M. Sudre also identifies our *R. adscitus* Gen. (Set of Brit. Rubi, No. 13) with *R. hypoleucus* Lef. & Muell.

R. LEUCOSTACHYS (Schleich.) Sm. In 1890 (Journ. Bot. 1890, 131) Dr. Focke objected to the name *leucostachys* as unsuitable, possibly following out Nyman's comment, "nomen paullo anterius (1824) sed incongruum" (Consp. Fl. Eur. p. 218), adding, "The name *leucostachys*, or 'white spike,' shows that the author did not include the ordinary pink flowering form." But, as Mr. Marshall has pointed out, the name fits remarkably well the colouring of the spike in *bud*; and Smith cannot have intended the name for the flowers, which he describes as "white or pale red." Smith's description (Engl. Flora, ii. 403) may not be very full, compared with a modern standard, but it is quite clear. He evidently had numerous specimens through his hands, among which one reached him through Mr. Forster "from a well-known Swiss botanist, Mr. Schleicher, under the above name."

Dr. Focke now changes his ground, saying that "*R. leucostachys* has hitherto been an aggregate conception . . . has not been applied to a definitely circumscribed species; so that it cannot replace the name of *R. vestitus*." If every name about the interpretation of which mistakes had been made must on that account be given up, there are few of bygone days that would survive! But, if there is one bramble more than another that has always been clearly recognized by British botanists, it is *R. leucostachys*, in spite of the various forms, which, before they were detected as hybrids, were often a puzzle to our predecessors in British batology. We venture to think that better reason should be shown than has yet been advanced why the law of priority should be broken in this particular instance.

R. GYMNOSTACHYS Genev., "treated as a var. of *R. leucostachys* in Handb. Br. Rubi, is now considered by Dr. Focke to be a good species" (p. 76). M. Sudre alleges (Observ. sur Set Brit. Rubi, 1904) that Genevier has confounded under this name at least four distinct forms, and that the plant we issued (Set, No. 14) as *R. gymnostachys* is different from all these four forms, and cannot bear that name. Perhaps on this account M. Boulay has omitted all mention of *R. gymnostachys* Genev. in Rouy & Camus, Fl. Fr. It would be interesting to know whether the plant Dr. Focke (who helped us to name our British plant) has selected for the type is identical with any of Genevier's four forms, or, like ours, distinct from them all.

R. ANGLOSAXONICUS Gelert. M. Boulay (Rouy & C. Fl. Fr. vi. 465) has identified Gelert's plant with *R. Schummelii* Weihe (ap. Wimm. & Grab. Fl. Silesia). The date of the *Flora of Silesia* is 1840, so that *R. apiculatus* W. & N. (1825), with which Dr. Focke identifies *R. anglosaxonicus*, is of earlier date. If, however, we are to be guided by the description and plate in Rubi Germ., *R. apiculatus* seems to differ from *R. anglosaxonicus* in having a roundish stem, leaflets of medium size, and obovate terminal leaflet; whereas in *R. anglosaxonicus* the stem is angular, subsulcate, the leaflets large, and the terminal leaflet long, narrow, oval with nearly parallel sides; so that, on a comparison of specimens, it is not unlikely that there would be a varietal difference at least between the two.

R. LEYANUS Rogers. We see no reason for altering this name.

R. ECHINATUS Lindl. Lindley's description (Lindl. Syn. ed. 1, p. 94 (1829)) is long enough for us to repudiate Dr. Focke's reproach of "*nomen seminudum*," and most of the characters given are good, though we will not claim it as a good description. This is, however, mended by Babington (Bab. Man. ed. i. (1843) p. 96), whose description is as follows: "16. *R. echinatus* (Lindl.); st. arched angular hairy setose, *prickles numerous and rather unequal decurved*; l. quinate, *leaflets ovate with a long tapering point coarsely and unequally serrate*, opaque above, green and velvety beneath, panicle spreading, leafy at the base, with corymbose branches.—Lindl. Syn. ed. i. p. 94.—Setæ numerous and nearly equal in length. L. tapering in a remarkable manner, jagged." Thus, sixteen years before Mueller published his *R. discerptus* (1859), the plant, imperfectly described at first, was unmistakably, and, for those days, fully described by Babington.

M. Boulay also displaces *R. echinatus* in favour of Mueller's name, on the ground that Lindley and Babington applied it to different species, and that it therefore lacks precision (Rouy & C. Fl. Fr. vi. 92). This objection would be difficult to prove. Babington quotes Lindley's first description, and there is herbarium evidence that the plant was widely known. The error that crept in was not ambiguity about the plant, but about the name. Lindley (Syn. ed. 2) was led to identify his plant with *R. rudis* Weihe; Babington, in the later editions of his *Manual*, followed suit; and this mistake continued till the true *R. rudis* Weihe was discovered, and identified, for Britain, about 1886, when *R. echinatus* Lindl. was rescued from its long submergence in *R. rudis*, auct. Brit., and reinstated in its true position. Dr. Focke corrected the error first; in Syn. R. G. (1877) p. 322, he gives "*R. echinatus* Lindl. Synops. Brit. Flor. (1829), *R. rudis* Babingt. Brit. Rubi," with no reference to *R. discerptus* P. J. Muell. In 1890 (Journ. Bot. 1890, 132) he still adheres to *R. echinatus*, but adds, "*R. discerptus* P. J. Muell. I suppose will prove to be the same plant."

Hence it appears to us that our choice should lie, not between *R. echinatus* Lindl. and *R. discerptus* P. J. Muell., but between *R. echinatus* Lindl. and *R. echinatus* Bab.

R. NEWBOULDII Bab. is identified by Dr. Focke with *R. insericatus*

P. J. Muell., and is subordinated to *R. obscurus* Kalt. It is difficult to see specific relation between *R. Newbouldii* and *R. obscurus* Kalt.; still more to see how the former can be identified with *R. insericatus* P. J. Muell. For by this latter name different forms allied to *R. fuscus* have been usually understood, a confusion which has led M. Boulay to refuse it a place among the five varieties of that species he enumerates. M. Sudre connects *R. Newbouldii* with *R. obsectifolius* Muell. as an allied form; but as this is placed by M. Boulay among the hybrids, we do not think this suggestion more illuminating than the opinion of Dr. Focke. We incline to keep *R. Newbouldii* Bab. where it is placed in the Handbook.

R. Bloxamii Lees is claimed by Dr. Focke as equivalent to *R. thyrsiflorus* W. & N.; and by M. Sudre as nearly allied to *R. Babingtonii* Bell Salt., and admitted to be near *R. multifidus* Boulay & Malbr., the latter being placed by M. Boulay as a subsp. under *R. Menkei* Weihe. These are, of course, rather divergent opinions. So long ago as 1890 Dr. Focke said of *R. Bloxamii*, "It is closely allied to *R. thyrsiflorus* W. & N., and perhaps the two species run together." We are, however, far from satisfied that the two are identical. The resemblance is hard to find between *R. Bloxamii* and the one specimen we have from Dr. Focke of *R. thyrsiflorus*. We know the former well, and have large series of specimens in our herbaria. Not one of these seems near to the figure of *R. thyrsiflorus* in Rub. Germ., which differs from them conspicuously in its ovate, shortly acuminate terminal leaflet (that of *R. Bloxamii* being constantly obovate, subtruncate-mucronate, with a longer point), and in its long narrow cylindrical panicle, in great part ultra-axillary (that of *R. Bloxamii* being lax below, with long rigid branches, and leafy almost or quite to the roundish top).

British botanists will have no difficulty in distinguishing *R. Bloxamii* from *R. Babingtonii*. With *R. multifidus* it was identified in the Handb. Brit. Rubi on specimens supplied by Mr. Friderichsen; M. Sudre allows proximity, but seems to deny the identity. After the fullest consideration, therefore, we are disposed to retain *R. Bloxamii* in our list, and to consider *R. thyrsiflorus* as still unknown in the British Isles.

R. acutifrons A. Ley, said by Dr. Focke to be *R. humifusus* W. & N. There is much resemblance between the two, if the only specimen we have of the latter, labelled "*R. humifusus* Wh. & N. sec. exempl. exsicc. Platjenwerbe, near Bremen, N.W. Germ., July, 1897, W. O. Focke," is at all typical. The plate and description in Rub. Germ. of *R. humifusus* also fairly represent Mr. Ley's *R. acutifrons*. The former differs, however, in the round stems more densely aciculate and dark purplish brown, prks. more slender, rachis more aciculate, sepals reflexed after flowering, petals white; *R. acutifrons* having stronger armature, stems angular and pale reddish brown, sepals strongly ascending after flowering, at length patent, petals pinkish. Apparently *R. humifusus* is but imperfectly known now, and it would be unadvisable to give up a definite name for a plant we know well in favour of one which has been variously interpreted, with little certainty as to the correct

interpretation; even were the identification more nearly complete. We can agree with M. Sudre in his comment on *R. acutifrons*, "c'est une forme du groupe du *R. Schleicheri* Whe.," in the sense that *R. Schleicheri* and *R. acutifrons* belong to the same group.

BOTANICAL RAMBLES IN GUERNSEY.

By E. D. Marquand, A.L.S.

It probably happens occasionally that a botanist visits the Channel Islands, hoping to gather for himself certain wild plants which are peculiar to the islands, and goes back disappointed because he has failed to find any trace of them. He may have met with many new and unexpected species, and so far been successful; but the particular things he was most desirous to see have been missed for want of a little information as to their whereabouts. When once you begin to botanize in this favoured region you find that the different islands are, each and all of them, a good deal larger than they appeared on the map; and very likely much valuable time will be expended, first, in finding out the best places to go to, and next, in searching for plants which there is very little likelihood of finding. So it occurs to me that it may be helpful to intending visitors to give a few rough notes about the most interesting phanerogams of Guernsey and Alderney, and the localities where they are to be found.

First of all, as to time of flowering. As applied to these islands the dates given in the English text-books are not always to be relied upon. The trees and shrubs here come into leaf some three weeks or so later than in the Midlands, because the autumn is extremely warm and mild, and the spring, as a general rule, cold; consequently the trees go to sleep late and wake up late. I noticed one year, in Alderney, that the horse-chestnuts were only just beginning to burst into leaf on "Chestnut Sunday," when the splendid avenue at Bushey Park was in all its glory of blossom. But it is not so with the smaller vegetation; the average period of flowering is much about the same as in the South of England, but it extends longer; indeed, many wild plants continue in blossom nearly throughout the winter. Much depends, of course, upon whether the season is wet or dry, early or late; but, speaking generally, I think it will be found that the first fortnight in April, the first fortnight in June, and the whole of August, are the best periods for a botanist to visit these islands in order to see the largest number of the special rarities.

In the early days of April, provided the sun has not been too powerful, there is still a fair chance of procuring the curious little fern, *Ophioglossum lusitanicum*, although it is a midwinter plant, fruiting in January and February. It grows in small patches, a yard or two in extent, among dwarf vegetation on the cliffs east of Petit Bot Bay; and there are many of these patches along half a mile of coast. But the plant is so inconspicuous, that it is by no

means easily found without a pretty close search. In the same neighbourhood, as well as all along the southern cliffs, *Mibora minima* flowers as early as March, but it grows more plentifully on the sandhills near Vazon Bay and elsewhere, on the north-west side of the island. Another grass may be looked for, *Milium scabrum*, as the original specimens were gathered on the cliffs near Petit Bot Bay in April, but in a somewhat inaccessible spot, and the plant has not been found elsewhere. On dry stony cliff-paths, and bare mossy ledges, may now be seen at its best *Tillæa muscosa*, a lovely little plant, striking the eye at once by its brilliant red colour, but apt to be overlooked by a collector of flowering plants.

Romulea Columnæ is very abundant on all the cliffs of Guernsey and the neighbouring islands. Only a small percentage of the plants, however, seem to blossom, but more flowers are to be seen in some seasons than in others, and they are usually well out by the first or second week in April. Another rare species flowering at this time is the tiny violet, *Viola nana*, which occurs on some of the sandhills at the western end of Lancresse Common.

The early spring months are the time to hunt for that very singular little plant *Isoetes Hystrix*, which was supposed to be confined to Guernsey until I discovered it in 1902 on the cliffs of Alderney, immediately opposite the coast of France. Most probably it occurs in Normandy, but it has not yet been found there. In Guernsey *Isoetes* grows in turfy ground close to the sea-shore in several part of Lancresse Common; but it is always a very troublesome little thing to find. There are multitudes of small plants that look just like it,—young *Plantago Coronopus*, for instance, or young *Armeria maritima*, and such like; but on digging them up you will perceive that they want the big spinous bulb that characterizes *Isoetes*. When once you have got the right plant, however, your eye will readily detect others by the leaves alone.

There is one excessively rare Guernsey plant, well developed at this time, which the visitor must not expect to get,—*Gymnogramme leptophylla*,—a graceful and delicate little fern which has its headquarters in Jersey. The last April plant to be mentioned is *Allium triquetrum*, which grows in clumps in all parts of the island in roadside hedges and waste corners. It is a common species, and its green leaves and pretty clusters of white flowers would make it a general favourite, but for its intolerably strong odour of garlic.

During the month of June, generally the first week, it is almost worth a journey to Guernsey to see *Orchis laxiflora* in all its glory. The marshy meadows in the low-lying parts, especially about Vazon, Cobo, and some portions of the Vale, are purple with these beautiful flowers; but, just a week too early or too late, and the exquisite colour-effect is wanting. *Ononis reclinata* is a plant which the botanist should not waste his time looking for in Guernsey, as it grows only in one spot on Lancresse Common, and there sparingly. The place to see it in abundance is Alderney, all along the coast from Fort Albert round to Longy Bay. It grows in rather bare or stony places, where the vegetation is short and dwarf, a few yards away from the sea-bank. Another prize that Alderney offers

is *Helianthemum guttatum*, which grows in profusion on the cliffs near the old mill. The collector must remember that it is necessary to press the flowers as soon as they are gathered, as the petals drop off almost immediately, in spite of the most careful handling, although they are apparently uninjured by a gale of wind while they are growing. This species is peculiar to Alderney and Jersey, and so is another non-British plant, *Orobanche Millefolii*, remarkable by its deep violet-blue flowers. It is parasitic on yarrow, and is generally distributed throughout Alderney, the second week in June being about the best time to see it.

Whilst in Alderney search should be made, if time permits, for *Bupleurum aristatum*, which is, as in Guernsey, quite plentiful on nearly all the sandhills near the sea. But it is so diminutive, and so intermixed with other plants, that it is seldom noticed by the untrained eye. I may as well note, in passing, that a day's excursion to Alderney, by steamer from Guernsey, allows some four or five hours on the island, which is quite sufficient time to collect the plants mentioned above, if the collector is a fairly good walker.

In Guernsey *Silene quinquevulnera* is confined to three or four stations at the Vale, the best of which was a few years ago the slopes of the hill which is crowned by the Vale Castle; but this habitat is now very nearly destroyed by the great granite quarries and stoneworks in the immediate neighbourhood. June is too early for most of the grasses, but by the end of the month *Lagurus ovatus* will already be showing its little woolly heads, which cannot possibly be mistaken for anything else. It is abundant all along the sandy coast of Guernsey, the only locality in the Channel Islands in which it is indigenous.

In the month of August we have a veritable *embarras de richesses*, and, therefore, let him who goes botanizing in Guernsey at that time carry a capacious vasculum; he will find plenty to fill it. One of the best localities for a day's excursion is the marshy tract called Grande Mare, a quarter of a mile from Vazon Bay. It is the home of many of the greatest rarities in the local flora, among the best of which may be mentioned *Spiranthes æstivalis* (restricted to this station), *Carex punctata*, *Callitriche truncata*, and *Cyperus longus*. Following the course of the stream as far as the coast, and then turning in the direction of Cobo, you come upon *Cynodon Dactylon* and *Centaurea aspera*, both in plenty. Just here, in places, *Herniaria glabra* carpets the ground, and may be seen all along the coast as far as Lancresse. On the western side of Vazon Bay *Bromus rigidus* occurs, but not commonly; and still further west, towards Lerée and Perelle, *Phalaris minor* grows in some quantity quite wild in sandy ground. It resembles *P. canariensis*, but may be recognized at once by its more elongated cylindrical heads.

One of the principal desiderata of botanists who go over to Guernsey in August is *Cicendia pusilla*, a very small plant with lilac flowers, which grows in two or three places at the eastern end of Lancresse Common. It is not by any means plentiful, and in some seasons hardly any flowers show themselves. This little

plant was first discovered in Guernsey in 1850 by Capt. Gosselin, who brought it from Lancresse Common, among other things, for identification, to Mr. Frederick Townsend, the author of the *Flora of Hampshire*, and through Mr. Townsend it was recorded by Prof. Babington in the *Botanical Gazette* for December, 1850. *Cicendia filiformis* and *Juncus capitatus* are not rare in this neighbourhood, and both species also occur on the cliffs. In waste ground and old quarries in the parish of the Vale *Gnaphalium luteo-album* is almost certain to be found; and sometimes it occurs abundantly in cultivated ground. I once saw a potato-field completely filled with this plant,—fine specimens twelve or eighteen inches high. *Arthrolobium ebracteatum* grows in several places on Lancresse Common, and also at Cobo; and yet it must be described as rare. In Alderney it is much more plentiful, and also in Herm.

I would advise the visitor to make another excursion to Alderney during the month of August, as he will get some very rare plants there, which he has but little chance of seeing in Guernsey, unless he knows exactly where they grow. Besides *Arthrolobium* he will find *Sinapis incana* in profusion between the harbour and Fort Albert; and one of the very commonest of Alderney grasses is *Bromus maximus*. One of the great floral treasures of Alderney is *Statice lychnidifolia*, but there is so little, that if the collector is lucky enough to meet with it, I must beg of him to take only a single specimen, as this species does not occur anywhere else in the Channel Islands.

So many of the plants I have named are such little insignificant things that it is a pleasure to include among the prizes of Guernsey a plant five feet high than can be recognized fifty yards away,—I mean *Allium Ampeloprasum*. If you ascend the road leading from the bathing-places through Fort George, you will see it on both sides of the road after you have passed Clarence Battery, but mostly inaccessible. It also grows in other localities, but all of them within the precincts of the Fort; so, in trying to procure specimens, it is as well to be careful, as the military rules are very strict. *A. Ampeloprasum* also grows in Herm, but it is not native there as it is in Guernsey. This fine species is at its best about the middle of July, or a little earlier. *Brassica Cheiranthus* is very rare in Guernsey, and, though the botanist may by chance stumble upon a stray specimen, he had better rely on getting the plant in Jersey.

Cynosurus echinatus is an unmistakable grass, very local in the north of Guernsey, but occurring abundantly when found at all. It seldom grows in the same profusion, however, two years in succession in the same spot.

I have now completed the list of all the plants of Guernsey and Alderney which are peculiar to the Channel Islands, as well as some which, although found in Britain proper, are sufficiently rare to merit enumeration among the best plants of these islands. To these may be added: *Briza minor*, generally distributed, but it is rather rare in cultivated ground. *Polycarpon tetraphyllum*, common everywhere in fields and waste places. *Scrophularia Scorodonia*,

found in hedges, bushy places, and old quarries, here and there throughout Guernsey, but more common in Herm. This species is a true native, and not, of course, a colonist, as I described it by an oversight in my *Flora of Guernsey and the Lesser Channel Islands*. *Matthiola sinuata*, rare, on the sandhills from Lancresse to Rocquaine. *Orobanche amethystea*, parasitic on the sea-carrot on several parts of the coast, but rare. *Sibthorpia europæa*, very local, growing in sheltered, shady spots by streamlets and springs in a few places in the island.

In conclusion, I may enumerate the following species as among the rarest plants in the Guernsey flora, and the visitor may well consider himself fortunate if he happens to meet with any of them: *Hyperieum linarifolium*, *Lavatera sylvestris*, *Lythrum Hyssopifolia*, *Eryngium campestre*, *Echium plantagineum*, *Polygonum maritimum*, *Euphorbia Peplis* (plentiful in Herm), and *Polypogon monspeliensis*.

SOWERBY'S DRAWINGS OF FUNGI.

By Worthington G. Smith, F.L.S.

(Continued from p. 186.)

125. Cortinarius (Telamonia) evernius Fr. There is a good wholly-coloured original of this with an additional figure. The published plate is numbered in error 225. The number on proof-plate is 125. There are two notes on the original, "firm pleasant mushroom tast" and "often with a purple base to stipes."

126. Agaricus (Tricholoma) sejunctus Sow. There are two sketches in the British Museum, one labelled "terreus," but both may be *sejunctus*. On one drawing is written, "Disagreable tast" and "gills brittle." There is other writing not legible.

127. Agaricus (Collybia) dryophilus Bull. There are five drawings of this species by Sowerby. The upper figure on the plate is ½ in. more in diameter, and ½ in. longer in the stem than original. There is no original for the left-hand or middle groups; there is an original for the right-hand figure and one other original. The section has a pileus ¼ in. more in diameter, and half an inch shorter than the original. Of the unengraved sketches there are two groups of six each, a group of three, a group of two, a single example and section.

128. Bolbitius titubans Fr. There is a good original of this.

129. Agaricus (Collybia) radicatus Relh. There is an additional large figure partially coloured on the original drawing.

130. Cortinarius (Telamonia) bulbosus Fr. There is a very good wholly-coloured original of this, but with gills more olive-tinted than in plate. There are a few slight pencil sketches at the back of the drawing. Sowerby has written the following characteristic note on this drawing: "Bulbosus Schæff 241 With[g] refference is Ag[s]. muscarius Bolt 48 ditto is a var[ty]. of A muscarius

also refference to Bull[d] A ovoides which is a variety of A. muscarius is rong the whole of D[r]. With[s] refferences seems to be A muscarius the varieties of which are made into infinite species."

131. AGARICUS (PANÆOLUS) SEPARATUS Linn. There are seven figures in the original in place of six on the plate, the details of the hollow stem are omitted on the plate, and the imperfect section on the right of plate is coloured in original. There are several notes; one says, "Tast as good as Ag. campestris"; another, "gills a little decurrent at the lower edge of pileus, easily split and seeming composed of numberless colorless . . . containing y[e] black powder or seed emitted from them." On the back is written, "confirmed these and 2 or 3 others of one kind, finding all sorts or varieties in plenty about the great . . . . Kensington Gd[s]." "some with a few gills," and "I have not figured this plant in the most common appearance perhaps as it has been little noticed in this state."

132. POLYPORUS IGNIARIUS Fr. The original is a pencil outline only, with nearly an inch more projection from the bark than on plate. The small section given in the plate does not exist; there is a different section drawn on the original. There is a second example of the same species faintly drawn on the back of the original.

133. POLYPORUS FOMENTARIUS Fr. Like the last, the original is an uncoloured pencil sketch. Sowerby's notes on the drawing are of interest; one says, "When I first began to investigate this plant it appeared so nearly related to Boletus igniarius of Linn[s]. & and (*sic*) B. lucidus and so entirely between them in all its characters that I was much at a loss but With[s] fomentarius is described so like the first that I would willingly have concluded it was so, yet was not satisfied till Dr. Afzelius an eminent pupil of Linn[s] confirmed my oppinion, as also the ingenious Dr. Turner it is never so hard in texture as B. igniarius yet somewhat harder than B. lucidus is sometimes of the same horse hoof shape as Dr. With[g] observes his description of the pores being sea green seems to be a mistake which I take the liberty to mention lest it should continue to mislead." * Other notes say, "the substance is like fine hairs matted together like beaver down was and is soft in the natural state as B. igniarius in the manufactured state and is used at the famous mine at the Howze in Germany as tinder," and "The Boletus igniarius is more common and manufactured for tinder by boiling, baking and beating the Boletus is fit for use without manufacturing and is common among the miners at the haiz in Germany."

134. POLYPORUS LUCIDUS Fr. The original is a very slight uncoloured sketch without the section at the base. There is a second large and very good illustration, being two views of the same plant. On the back of the original of the plate is written: "Not very common with the softish yellow edge in a growing state altho I have found in hornsey wood Peckham Woods and many specimens

* The sea-green colour is caused by unicellular algæ.

in hainault Forest &c Mr Watford of Essx favared me with the beautiful specimen here figured and is mostly with a stipes elevating the pileus and joined laterally, but sometimes descending and I have some specimens sessile, consequently sportive, the texture of the inside is not unlike fomentarius but rather softer it is mostly distinguished by a lacquere or varnish covering it all over except the pores which exude a fine whitish mealy powder in the latter state a brown powder succeeds perhaps the seed." "I have the gum of varnish from the trees where the plant . . . ."

135. POLYPORUS SULPHUREUS Fr. The original is uncoloured, and $\frac{7}{8}$ in. more across than the figure on the plate. On the proof-plate is written, "Boletus sulpheurius" and "pores scarce any." On the back of the original is written: "This is not uncommon on various trees I've found it on the Chestnut trees in greenwich parks on Oaks Hamsted &c on a Willow in Battersea meadows it is found at most season of the year after rain it seen often to monstrous size and mass, in the course of 12 of 14 days when dry it will moulder like rotten wood, or tinder if lighted and I understand in some parts of germany they make it into powder (which it's rotten and friable texture renders easy as it readily breaks in any direction) and put into Boxes for use, when fresh gathered if not laid in a very dry place and reversed in the position the part that was upermost when growing will produce pores and those protuberances that do not extend to the general edge of the imbrucations are mostly covered with pores—sometimes it is altogether ramose all externally covered with pores whence Mr Bulliard Boletus Ramosus the smell is fragrant and even in burning the odour is somewhat gratefull."—"Sometimes the pores do not get to the edges."

141. HYGROPHORUS PRATENSIS Fr. There are two additional illustrations on the original drawing. There is a note to the upper figure which says, "not cracked and gayer or more of a salmon colour" and "some white."

142. AGARICUS (CLITOCYBE) OPACUS With. On the original there is a sketch of another example and a section of a much stouter specimen, with a group of four plants probably representing *Agaricus dealbatus* Sow. The section on plate is $\frac{3}{4}$ in. more in diameter, and not quite like the original. Notes say—"opaque shining," "rubbed off," "wet weather specimen," and "mushroom tast."

143. AGARICUS (CLITOCYBE) PRUNULUS Scop. The original is remarkable for two notes; one says, "Smell like Boletus squamosus which is said to be a mealy smell," the other, in reference to the gills, "colored with the actual dust from ye 2 sides of the gills which within are similar to the fleshy part of the pileus of a pure white. When near maturity if kept a few days it will invariably emit this powder gills otherways white." The colour of the salmon-tinted spores has remained quite unchanged on the drawing to the present day.

154. HELVELLA ELASTICA Bull. There is no original of this, but there is a well-finished coloured drawing with four examples in the

Dickson-Sowerby collection; none of the figures, however, agree with this plate.

156. Thelephora anthocephala Fr. The original is a partially-coloured pencil drawing.

157. Clavaria muscoides Linn. The original is incomplete as regards drawing, and only partially coloured; a note states, "mealy, not shining."

158. Thelephora cristata Fr. The original is an extremely rough pencil sketch, just touched with colour, and unlike the plate.

161. Agaricus (Leptonia) chalybæus Pers. The original has the following note, "tast somewhat mushroomy but strong and unpleasant." There is a second drawing of the same species with colour partially gone, and no notes.

162. Agaricus (Leptonia) incanus Fr. There is an original of this; the small figure on the plate is an addition. Sowerby has written "Agaricus mus" on his drawing in reference to the mouse-like odour.

163. Marasmius caulicinalis Fr. The group of four examples on the plate is not on the original; the stem is noted as "solid but stringy."

164. Marasmius Hudsoni Fr. There is an original of this with five examples; these are expanded to twelve on the plate. The separate slightly enlarged figure at the base of the plate is not on the original.

165. Agaricus (Mycena) parabolicus Fr. The original is not quite like the plate, either in shape or colour. The stem is pale salmon-lavender on the original, pale slate on the plate; there is no slate tint on the pilei in the original. A note in reference to the stem says, "very tough stipes &c." There is a note in Sowerby's writing on the proof-plate in reference to the strigose stem, "to be perfectly white all the roots."

166. Agaricus (Psathyrella) disseminatus Pers. There is a partially-coloured original of this.

167. Agaricus (Psathyra) noli-tangere Fr. The original is partially coloured, not so dark aud more yellow than plate. There is a note, "tast mushroomy but watry."

168. Panus cochleatus Fr. The small group on plate is not on the original drawing.

169. Agaricus (Mycena) proliferus Fr. There are three very slightly tinted originals, two almost alike; on one drawing is written, "stipes splitting in drying." The published plate is different in colour from the proof-plate.

170. Coprinus picaceus Fr. The imperfect stem section on the plate is perfect on original. There are two jet-black gill impressions on the original drawing.

172. Agaricus (Clitocybe) elixus Sow. There is an additional figure on the original, and the pileus on the plate is much darker than the drawing. The gills—except in one sketch—are left white

on the original. On the drawing is written, "pithy" and "tast like ags esculentus but watry"; the gills are said to be "sometimes more numerous and somewhat yellowe." At the back of the drawing is written, "sodden."

173. CORTINARIUS (TELAMONIA) HINNULEUS Fr. There is a good coloured original of this with additional pencillings of other examples; there is also a second drawing of two large examples with a coloured section, unengraved. A note on the original says, "gills much darker," and this instruction has been carried out on the plate. A further note as to gills says, "more detached from stipes"; and as to pileus, "sometimes cracked." On the unengraved sheet is written, "smell like Agaricus campestris, but has a bitter unpleasant tast."

174. AGARICUS (ENTOLOMA) COSTATUS Fr. The original drawing of this is on the back of the original of *A. cervinus* Sow. t. 108. The transverse ribs on the gills, distinctly shown on the drawing, and from which the plant derives its specific name, are omitted on the plate. This led Fries to erroneously name the plate *Agaricus* (*Pluteus*) *chrysophæus* Schæff. On the drawing is written, "on a rotten stump almost covered with grass." Of the stem Sowerby says, "silky and shining"; of the gills, "not shining"; of the pileus, "rought and powdery." He refers to the veins on the gills as "not quite regular undulations," yet omits them on the plate.

175. BOLETUS BADIUS Fr. There is an original of this, but the section is the only part coloured. Fries refers this to *B. scaber* Fr., but neither drawing nor plate is like *scaber*. A note says, "turns blue after being cut a little while"—*B. scaber* does not change colour to blue.

182. LENZITES BETULINA Fr. The original is a very careful pencil drawing, uncoloured.

183. SCHIZOPHYLLUM COMMUNE Fr. The original is practically the same with the plate; there is, however, an additional example on the drawing. Sowerby says he found his specimens "on a Bear Cask."

185. AGARICUS (CLITOCYBE) FLACCIDUS Sow. The original is somewhat paler in colour than the plate; notes say: "stipes often thinner" and "tast mushroomy but insipid."

186. AGARICUS (CLITOCYBE) INFUNDIBULIFORMIS Schæff. The original group is an uncoloured outline; the section is, however, coloured, but not quite the same colour as the plate. A note at the back of the drawing says: "Tastless in large quantities and clusters not lactescent the specimen brought home was hollow in the stipes but could not tell whether or not it was affected by insects."

187. AGARICUS (CLITOCYBE) LACCATUS Scop. (see also 208, var. AMETHYSTINUS Bott.). The original is much more turquoise in colour than in the plate. On the proof-plate is written: "Should not this be more of a lilac color as it is then moist." On the back of the drawing is a remark as to the gills,—"partly decurrent in a young state but seems to detatch from the stem when older." The

detachment of the gills shown on the plate is not on the original drawing.

188. Coprinus atramentarius Fr. The original is partially coloured and much larger than the plate. Sowerby calls his plant *fimetarius*. Fries, from an examination of the plate only, makes it *C. atramentarius;* but both drawing and plate are more like the form *sobolifer*us Fr., now usually regarded as a species. The following note is on the original: "A great quantity of burnt coffee that was brought from the fire at Walbrook produced this fungus in abundance, the pileus somewhat pinky and a great deal of farinaceous roughness on the pileus like the sugary appearance on A. congregatus the top of the gills pinky."

189. Coprinus comatus Fr. This is made up from three drawings, all in outline except a shaded section.

191. Polyporus rufescens Fr. There is a coloured original of the large upper figure of plate and two other unengraved figures—one coloured, the other not. The lower figure on the plate is not on the original. The proof-plate in the museum is uncoloured.

192. Polyporus perennis Fr. The original is an uncoloured pencil drawing without the grass which is shown as growing through the pileus on the plate. On the back of the drawing are three other pencil sketches of the same species. There is one note,—"solid."

193. Dædalea confragosa Pers. The original is an uncoloured pencil sketch without notes.

197. Agaricus (Mycena) strobilinus Fr. The original is in three detached groups; the pilei are coloured rose-crimson, with a note, "more scarlet"; this is correct, as the natural colour of the pileus is carmine or scarlet-rose. The plate has the pilei claret-colour; this is not like the original with its accompanying note or like nature.

198. Geaster fornicatus Fr. The original is an uncoloured pencil sketch of the slightest possible character, and only slightly agreeing with the plate. On the drawing is a sketch of threads and spores, with an asterisk; a duplicate asterisk is on the profuse cloud of spores seen issuing from the osteolum.

199. Clavaria tuberosa Sow. The original, with the exception of part of the supporting branch, is wholly coloured. The plate is reversed. There are four groups of clubs on the plate, but only one—dull ochre in colour—the largest on plate, on the original drawing; on the latter is a little immature group on the left, omitted in the plate. As regards the free group of three clubs on the plate, there are five on the original, and the figure on the drawing is $\frac{5}{8}$ in. longer, and the dull salmon-brown colour of the original is labelled "the whole brighter." The salmon-coloured section on the drawing is twice the diameter of the figure on the plate, and nearly twice the height; it is labelled "hollow" "sollid" in reference to the hollow apex and solid base.

201. Russulæ. This plate is made up from three drawings;

Sowerby names the plate *Agaricus integer* L., but this is a mild species, whilst the plants illustrated—at least in part—are acrid, as Sowerby's notes show. The yellow example is *R. ochroleuca* Fr.; the blood-red may be *R. emetica* Fr.; and the rose-coloured example *R. vetemosa* Fr. The three upper examples and section are from one drawing, the yellow and purple below from another; the latter is more rose-coloured in the original, where there is also a rose- and slate-coloured specimen. On this sheet are three large pencil outlines of three other of the *Agaricineæ*. Sowerby writes, of what he calls *Agaricus integer*: "a very common plant in or near woods everywhere and in all damp seasons; easily known when once recognized tho' varying much as is generally the case with such common species. Tho allowing in the general appearance the tast is extremly acrid, never found specimens with the lamellæ or gills connected, but what was approaching a decaying state and were evidently connected with the gossimer perhaps of some one of the aranæ." On a second sheet he writes,—"tast biting," and on the third, "disagreeable biting taste."

202. Lactarius deliciosus Fr. There is a good partially coloured original of this, with a much yellower pileus than plate, with a note on one pileus, "may be redder;" this instruction has been carried out on the plate. Near the base of the stem are some faint orange streaks, with the note,—"juice of plant;" the milky juice naturally changes to green on exposure to the air, but at the present time the streaks are ochre, the original natural colour.

203. Lactarius circellatus Fr. There is an original of this, containing six figures; four only are used on the plate.

204. Lactarius rufus Fr. Made up from two drawings, one showing the habit, the other the section; the latter without the milky drops of the plate. On the section is written, "lactescent and biting." This note shows that Fries was in error in referring the plate to *L. subdulcis* Fr. Three sketches of habit, with papillate pilei, on another drawing, are labelled "tastless;" these may belong to *L. subdulcis* Fr. In the middle of the drawing is a large *L. volemus* Fr., with a note, "a very pleasant mushroom tast (viz) Ags cams." Sowerby obviously had several different plants in hand which he confused together.

(To be continued.)

THE BOTANICAL CONGRESS.

More than six hundred members attended the Botanical Congress at Vienna from June 11th–18th. On June 11th members were invited to be present at the opening of the Botanical Exhibition in the Orangery of the Schonbrunn Palace, and among the exhibits was an interesting historical collection, including MSS. and drawings of Jacquin. The name of Nicholas Joseph Jacquin recalls the historic botanic garden of Schonbrunn, and a notable feature of the Congress was the unveiling of his bust in the Festsaale

of the University on Wednesday morning. Jacquin was professor of chemistry and botany at Vienna from 1768–96, and the inscription below the bust refers to him as Botanicorum Austriæ Ornamentum. A similar honour was paid to his contemporary, John Ingenhousz (1730–99), one of the fathers of plant physiology. The programme of the Congress included a large number of lectures and papers by well-known botanists on subjects of general or special interest. Excursions were arranged for the afternoons to places of interest near the town, while the evenings were given up to social functions, mainly of an informal character.

The most important feature, however, was the Conference on Nomenclature, sittings of which, with Prof. Flahault, of Montpellier, as President, were held in the lecture hall of the Vienna Botanic Garden.

Each afternoon during the week, from three to seven or eight o'clock, members representing nearly two hundred societies, institutions, and groups of botanists in both Old and New Worlds, worked slowly through the *Texte Synoptique*, which embodies the recommendations of the Botanical Commission appointed at the Paris Congress of 1900 to amend or modify the laws of nomenclature drawn up in 1867 by Alphonse de Candolle. The various schools of nomenclature were well represented. The Neo-American school found spokesmen in Dr. Britton, Mr. Coville, Prof. Underwood, and others; while Dr. Robinson, of Harvard, was present to represent, with a few English botanists, the views of the English school. Drs. Ascherson, Engler, and Urban brought a strong contingent from Berlin, and other parts of Germany and Austria were well represented; also Paris, Brussels, Geneva, and, in fact, most of the important botanical establishments in Europe.

A somewhat pathetic incident was the appearance of Dr. Otto Kuntze on the fourth day of the Conference. He received a hearty reception, and was loudly applauded on leaving the room after reading a protest, in his wonted outspoken manner, against the Conference and its participants. A marked feature of the Conference was the complete absence of any ill-feeling, and the evident anxiety of all present to find some solution of the vexed points. There will probably be opportunity for giving in detail the general results arrived at; mention may, however, be made of two:—one, the passing by an overwhelming majority of the list of names of genera which are to be retained on the ground of general usage for a number of years, though ruled out by strict priority; the other, a compromise on the question as to what name shall be adopted when the systematic position of a plant is changed, a question involving the so-called Kew rule. It was agreed that when the rank is unaltered the rule generally adopted on the Continent and in America should hold good; that is to say, in changing the genus name of a plant the earliest specific name should be retained: but when the rank is changed—if, for instance, a variety of *Salix* is elevated to species rank—it shall not be necessary to keep to the varietal name.

A. B. Rendle.

SHORT NOTES.

Drosera Banksii.—Dr. Alexander Morrison sends to the National Herbarium a specimen of *Drosera bulbigena* described by him in Trans. Bot. Soc. Edinb. xxii. 417. In his letter accompanying the specimen, he writes: "I am sorry to have rashly put forward the surmise that the original describers of *D. Banksii* had perhaps mistaken bracts for stipules in the only specimen available; but last year, when visiting Melbourne, I found *D. Banksii* in the Herbarium there, from Port Darwin, and each of the three specimens possessed stipules, and they were not early deciduous. Along with the description of *D. bulbigena* are some observations on the development of the bulb in Droseras, a subject that I have noticed since writing them had in 1848 excited Planchon's curiosity." The stipules are present in the series of specimens collected by Banks and Solander, but they are not represented in Sydney Parkinson's figure published in this Journal for 1900, t. 410 B. The discovery of specimens from Port Darwin is interesting, as when the note accompanying the figure was written we had no knowledge of any specimens save those collected by Banks and Solander.—James Britten.

Holosteum umbellatum in Surrey (p. 189).—I too had an opportunity of gathering this plant *in situ*. The plants on the ground evidently, I think, came from the walls, where I think it as native, if that be the proper term, as it was in East Anglia; probably to both places the seeds were blown from the Continent. The plant is soon choked out by grass vegetation. This, *Carex tomentosa*, and *Physospermum*, all within the London radius, show how imperfectly even the best worked areas are known.—G. C. Druce.

Glamorgan Plants.—During April and May this year I discovered *Mathiola incana*, *Rosa rubiginosa*, *Stellaria media* var. *neglecta*, *Carex montana*, new to v.-c. 41; and a new locality for *Hutchinsia*, which is rare here. The Rev. E. F. Linton has kindly named some sedges gathered in various parts of the county, including *C. acutiformis* × *riparia*, and hybrids of *C. stricta*, the other parents being probably *C. Goodenowii* and *C. acuta*. (An old herbarium specimen from Llanelly, Caermarthen, v.-c. 44, he names *C. acuta* × *Goodenowii*.) *Scirpus sylvaticus* is rare, *Carex binervis* common on upland moors, in v.-c. 41. Of Salices, we have *S. nigricans*, *S. pentandra*, *S. purpurea*; the first and second are doubtfully native: I have as yet seen no female plants of *S. nigricans*, a point which seems to tell against its indigeneity; and *S. pentandra*, though there are good female bushes, is too closely associated with *S. nigricans* here to be treated differently. Mr. Linton has named or confirmed *S. aurita* × *cinerea*, which is fairly frequent near Aberdare, *S. aurita* × *Caprea*, *S. cinerea* × *Caprea*, and *S. triandra* × *fragilis*. All new to Glamorgan, except *Hutchinsia*.—H. J. Riddelsdell.

The "Supplement to 'Topographical Botany.'"—A word of explanation, and of protest, is I think necessary as to the way Mr. Newbould's name is used in the above work. In 1877 Mr. H. C.

Watson asked me to work at the botany of West Ross-shire and Wigtonshire, of which at that time no list even of the common plants had been made. Accordingly, in 1880, I visited West Ross, and made a list of nearly four hundred species and varieties, the great majority of which were additions to the county flora. Voucher specimens of most were secured, and the list appeared in the *Rep. of Record Club*, pp. 168–175, for that year. In 1882 I visited Wigtonshire, and obtained five hundred and forty-two plants, of which over five hundred were new county records. This list appeared in the *Rep. of Record Club* for 1883, pp. 65–76. The list of West Ross plants was given to Mr. Newbould, and for the earlier portion of *Top. Bot.* ed. 2, he quoted the records; subsequently he evidently mislaid them, since they are not quoted in the latter part. For that reason I printed them in the *Scottish Naturalist*, and afterwards, with additions, in the *Trans. Bot. Soc. Edinb.*, 1894, pp. 112–170. The list of Wigton plants, as well as my new records for Oxon, Bucks, Berks, Northants, &c., were given to the Rev. W. W. Newbould, for use in another edition. All these are quoted as "Newbould" by Mr. Bennett in his Supplement, which is inaccurate, and I think unfair to both Mr. Newbould and myself. For instance, *Vicia gracilis*, which is credited to him, he knew nothing about; it was misnamed, but the history and correction of the error will be found in my *Flora of Berkshire*. Mr. Newbould is therefore made responsible for an error which he never committed. It is extremely misleading to see his name connected, without any explanation, with Ross-shire and other counties which he had never visited. In these (and it may be other recorders are treated in the same way) the more correct citation would surely be to quote the finder's name.
G. Claridge Druce.

[We print Mr. Druce's note as we have received it, but we hardly understand his complaint. We believe that Mr. Newbould, certainly the last man to claim credit due to others, supplied Mr. Bennett with lists for various counties, and the latter cited Mr. Newbould's name as the only authority he knew. With regard to *Vicia gracilis*, Mr. Druce's correction seems in need of further amendment: Mr. Bennett does not record the plant for that county, it having already been credited to Berks in *Topographical Botany*, but for Oxfordshire; and we find no "history" or "correction of error" for the latter county in the *Flora of Berkshire*. As to quoting the finder's name, that is not always either possible or desirable; the necessary investigation and inquiry would certainly not be worth the trouble and time involved, and the result would be unconvincing. For example, *Arnoseris pusilla* was first found in Berks by Mr. W. W. Fisher; it was, however, recorded by Mr. Druce, and his record is naturally assigned to it by Mr. Bennett. It is clearly desirable that some botanist of repute should be cited as an authority, in preference to an amateur whose determination may not be accurate, or who has found the plant, as Newbould used to say, "empirically." We may take the opportunity of saying that the insertion of references to printed records in place of the name of the recorder was due to our repre-

sentation to Mr. Bennett that our space would not allow the printing of both recorder and reference, and it seemed to us that the latter would be more generally useful. Entirely apart from the point at issue, we cannot but feel that the anxiety for "credit" in connection with first records, and still more in the making of new combinations in nomenclature, is becoming greatly overdone; a botanist's reputation does not depend upon trivialities of this kind. Ed. Journ. Bot.]

Aylmer Bourke Lambert in Ireland.—I do not find in the *Cybele Hibernica* any reference to A. B. Lambert as having botanized in Ireland. It may therefore be worth while recording that in his copy of the second edition of Hudson's *Flora Anglica*, now in the Department of Botany, British Museum, are numerous marginal notes of localities, many of them from Ireland. These, with the exception of one reference to Killarney, are from Co. Dublin and Co. Mayo, the latter from Castle Bourke, where he had doubtless been visiting his relations: the only date I find is 1790. I have not checked the localities with the *Cybele*, but have noted two which seem of interest—*Lathræa Squamaria*, "found upon a moist acclivity as we came up the seashore from Dunlary [now Kingstown] to Newton," and *Geranium columbinum*, "I found it about the Black Rock, Dublin, frequent": neither of these is noted in the *Cybele* for the neighbourhood of Dublin.—James Britten.

Isle of Wight Plants.—It may be worth while recording the discovery of *Aceras anthropophora* in the Isle of Wight. Mr. E. H. White, who observed it, and who sent a living specimen to me, writes in a letter of the 29th of May in this year: "I picked it in a meadow on the slope of Shanklin Down. For the last three or four years I have seen but two or three plants there, but a week ago I saw at least a dozen in bud. Visiting the spot yesterday, a keen search failed to find one." This is not a new county record, but it is evident from the notes in Mr. Townsend's *Flora of Hampshire* (second edition) that the plant has not been seen very recently in the county, and Mr. Townsend had not seen any Hampshire specimens. Mr. Townsend refers to the article by Mr. C. B. Clarke in this Journal for 1868 (p. 217), which was written in reply to Mr. H. C. Watson's amusing review (Journ. Bot. 1867, 51) of Mr. Clarke's *List of Andover Plants*. Mr. Watson had remarked upon *Ophrys apifera* and *Aceras anthropophora* not having been observed by Mr. Clarke within the five or ten mile radius from Andover, and from the omission of Hants in the list of counties in *Topographical Botany*, p. 381, Mr. Watson no doubt concluded that the plant did not occur in the county.

In July, 1846, Dr. Bromfield recorded that he had received from Mrs. Charles Brenton a specimen of *Dianthus Armeria*, which he states was found "near the Grove by Brading" by "[the late] Lady Brenton." Mr. A. G. More, in his Supplement (published in 1871) to Bromfield's *Flora Vectensis*, says of this plant: "Apparently quite extinct in the Isle of Wight. I have sought for it unsuccessfully for several years in the only known locality, a sand-pit at the side of Morton Lane." I lately found in my herbarium a specimen

gathered by the late Mr. W. Reeves in Sept. 1888, near Alverstone, Brading, which locality, if not identical with that described as "near the Grove, Brading," is very close to it. This is one of many instances which I have from time to time met with of the persistence of plants in certain habitats, and an extremely interesting subject for investigation would be the causes which tend to this persistence. The facts make it very difficult to say whether or not any plant is really extinct in any given locality.—Frederic Stratton.

Cheiranthus erysimoides Huds.—In preparing my new edition of the *Flora of Oxfordshire* my attention was again directed to the plant which Hudson describes in *Flora Anglica*, ed. 2, 287 (1778). Hudson cites the description and synonymy (with additions) of the *Species Plantarum*, ed. 2, p. 923, and adds: "Anglis Wild Stock or Wall-flower. Habitat in salicetis circa Godstow, prope Oxford, D. Perrin; prope East Grinstead in comitatu Sussexiensi." Stokes in Withering's *Nat. Arr. Brit. Pl.* ed. 2, ii. p. 699 (1787) retains the plant; but Smith (*English Flora*, iii. 201) refers it to *Erysimum cheiranthoides*. There is a specimen in the British collection in the National Herbarium, from Banks's herbarium, labelled by Banks "In salicetis circa Godstow prope Oxon, Perrin," which, in my *Flora*, I had placed under *Cheiranthus Cheiri*, and this is evidently Hudson's plant; it is undoubtedly a small-flowered form of wall-flower, and probably originated from the walls of the adjacent Godstow Nunnery. Hudson was evidently in error in identifying his English plants with the *C. erysimoides* of Linnæus, since Mr. B. Daydon Jackson, in answer to a note sent him by Mr. Britten, writes:—"The first sheet of Linnæus's *Cheiranthus erysimoides* agrees with *Erysimum lanceolatum* R. Br., DC. *Syst.* ii. 502, n. 22, in all save that the uppermost leaves are denticulate; in *Bot. Mag.* t. 2423, the uppermost are depicted as entire; the claws of the petals elongate after flowering, and the stigmas are very noticeable. Of course this is remote from *E. cheiranthoides* as understood to-day."—G. Claridge Druce.

Erica lusitanica in Dorset.—In the June number of the *Botanical Magazine*, t. 8018, this species is figured; in his accompanying description, Mr. Hemsley gives the following note:—"An interesting fact in the history of this species is its naturalization at Lytchett Heath, near Poole, by Lord Eustace Cecil. It is fully established and spreading rapidly. Photographs sent to Kew in March, 1901, represent large clumps in full blossom. The Hon. Mrs. Evelyn Cecil, who took the photographs, has kindly furnished the following particulars of its introduction to Lytchett:—'Two plants were bought by Lord Eustace Cecil for Lytchett Heath, about 1876. One was planted in the garden, and died after several years. The other was planted in rough ground just outside the flower-garden, and grew well. It began to produce seed about 1880, and since that date it has gone on increasing and seeding. Seedlings that have been transplanted into the grounds near have equally established themselves. Now between one and two acres of ground are covered with thousands of bushes. The average height

is from four to six feet, but many are over seven and eight, and one measures eleven feet. It seems to grow equally well in sand or clay. It is a curious fact that, although seedlings from Lytchett have been planted in many places in the neighbourhood, and have grown, none have as yet seeded, even on similar soil, within a few miles. The original plant lived about twenty-five years.'" *E. lusitanica* is not mentioned in the *Flora of Dorset*, nor in Mr. Dunn's *Alien Flora*, of which we learn that a new edition is in the press.

NOTICES OF BOOKS.

Index Filicum sive Enumeratio omnium generum speciorumque Filicum et Hydropteridum ab anno 1753 ad annum 1905 descriptorum adjectis synonymis principalibus, area geographica etc. By Carl Christensen. Copenhagen: Hagerup. Fasc. I. May, 1905. 64 pp. Price 3s. 6d.

Since the abrupt termination of Thomas Moore's *Index Filicum* (1857–62), which was never carried past the beginning of the letter G, no attempt until now has been made to publish a complete index of all known ferns with their synonyms. Yet the want of such a book is a great hindrance and often a complete impediment to the work of pteridologists. For there are hundreds of recent specific descriptions widely scattered through periodical literature, and the principal systematic fern-books are either too old or too incomplete to give the clue to the whereabouts of these original descriptions. Further, we require to be able to ascertain without repeated waste of time in what genus any given species has been placed in the very different systematic arrangements and schemes of nomenclature adopted by Hooker and Baker, Engler and Prantl, Christ, or others. Failing the production of a complete Synopsis brought up to date, we need for ferns those facilities of reference which are afforded by the *Index Kewensis* for flowering plants, or by Paris's *Index Bryologicus* for mosses. And this is what Herr Christensen offers us in his new *Index Filicum*, the second fascicle of which is due to be published. The complete work will consist of three sections:—I. A systematic enumeration of the genera, based on the system of Engler and Prantl. II. An alphabetical enumeration of the species and synonyms published between 1753 and 1905, including garden names. III. An alphabetical catalogue of literature "wherein new genera and species are described or examined." The author has been engaged upon the preparation of his *Index* during many years, and has taken an infinity of trouble to ensure the accuracy of his citations and dates. His manuscript is all ready for printing, and will make a book of about 750 pages, in eleven or twelve parts, at a total cost of about £2. A rough calculation shows that the book will contain upwards of 30,000 species and synonyms. The author pleads that intending subscribers to, and purchasers of, the work will send in their names as soon as possible; for, as he informs me in a letter, he finds the printing to be so costly that, unless he can obtain at least 200 sub-

scribers, he will be compelled to stop the further publication of the book. What a misfortune that would be to fern-students requires no demonstration.

A. G.

Manual of the Trees of North America (exclusive of Mexico). By Charles Sprague Sargent: with 644 illustrations from drawings by Charles Edward Faxon. 8vo, cloth, pp. xxiii, 826. Boston: Houghton, Mifflin & Co.

This well printed, well bound, and in every way attractive volume brings within the reach of those whose purses and bookshelves are limited the information stored in the author's *Silva of North America*. Mr. Sargent is, of course, the leading authority on North American trees, and the students for whom he has prepared this volume will not be the only ones who will welcome this excellent manual.

The order followed is that of Engler & Prantl's *Die Natürlichen Pflanzenfamilien*, which seems destined to replace, at no distant date, the *Genera Plantarum* of Bentham and Hooker. The introductory matter includes an analytical key to the families based on the arrangement and character of the leaves; there is a glossary of technical terms and a full (and we are glad to note, only one) index; a map of North America shows the eight principal tree regions into which the country is divided, according to the prevailing character of the trees.

The descriptions are very (but not too) full, and evince a thorough knowledge of the trees and of their distribution; the illustrations are evidently drawn with care, and, although small, are characteristic. Whether the student of *Cratægus*—a genus which is to Americans what *Rubus* is to British botanists—will be able to distinguish the species by the figures is, we think, uncertain; but it may be doubted whether any one but a specialist in the genus would be able to separate the plants themselves. The genus occupies more than one-sixth of the entire work, and includes one hundred and thirty-two species, eight here first distinguished. Large, however, as the number is, it would appear to have been largely reduced, for, as we pointed out last year (p. 57) in our notice of Dr. Small's *Flora of the South-eastern U.S.*, one hundred and eighty-five were described in that work for those States alone. The omission from Mr. Sargent's volume, probably due to the exigencies of space, of anything in the way of synonymy renders it difficult to ascertain where the reductions have been effected. In a book intended mainly for use in the field, or in connection with the plants themselves, such omission may be justified, but a limited amount of synonymy, or at least a reference to the place where the name retained was published, would certainly have added to the general usefulness of the work, especially as many of the names are far from familiar.

One or two points suggest criticism. We regret to see the abbreviation "Britt." employed for the name of Dr. N. L. Britton. There are two botanists whose names may be so abbreviated,

which is a sufficient reason for avoiding what is clearly an ambiguity. Nor is this merely imaginary: in the new part of the *Flora Capensis* reference is made to *Vaccinium africanum* "Britt.," by which is intended the other author, who can certainly claim the (in this case doubtful) advantage of priority. A reference to this Journal for 1903 (p. 87) will enable Mr. Sargent to correct the traditional statement that *Cliftonia* was named in honour of Francis Clifton, an English physician. In calling the tree *C. monophylla* Sarg. the author carries out his principle of adhering to the oldest specific name; in his *Silva* he had given Britton as the authority, but incorrectly, as, although Dr. Britton pointed out the priority of the trivial, he did not actually combine it with the generic name. We doubt, however, whether "*Salix Hookeriana* Hook." will be generally accepted, although, as we have more than once pointed out, it is in accordance with Art. 48 of the Decandollean laws, which says that "the author who first *published* the name or combination of names is to be quoted for it;" certainly Sir W. Hooker never expected to be cited as the author of a name commemorating himself, and he published it (Fl. Bor. Amer. ii. 145) as of "Barratt mst."

As we have already said, the volume is in every way excellent; the type, although small, is exceedingly clear and pleasant to read, and its employment enables a vast amount of information to be brought within comparatively small compass. Moreover, the book opens easily and lies open flat upon the table: these are small matters, but every one knows how much they add to the convenience of consultation.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society, on June 1st, the Secretary exhibited two photographs of *Corypha elata*. At the meeting of 18th June, 1903, photographs were shown of two specimens of equal age; one had normally flowered, fruited, and died; the other, instead of flowers, had thrown up a secondary central growth of leaves. The information now sent completes the record; the survivor in its turn had flowered and died, the inflorescences being developed from the secondary crown of foliage. On being cut down it proved to be 68 ft. in height, diameter at base 3 ft. 6 in.; diameter at base of secondary growth, 1 ft. 10 in. The secondary growth itself was 4 ft. in height, and the height of the spadix an additional 20 ft., 5 ft. of this being bare stem, the remaining 15 ft. crowded with twenty-nine huge branches. The crop of fruit numbered over 51,000, and weighed half a ton, most of the spadices being abortive. Mr. C. B. Clarke remarked that, though this palm grew in the Calcutta Botanic Garden, he had never noticed this abnormal behaviour, though branching in palms occurred in many species.

The recently issued part (vol. iv. sect. i. part 1) of the *Flora Capensis* takes up the continuation of the work from the place where

it was abandoned forty years ago. Nothing could show more plainly how impossible it will be when the Flora is completed—and it seems likely that it will now continue uninterruptedly to its conclusion—to regard it as a presentment of our knowledge at any one period. Save for one *Vaccinium*, the 192 pages are entirely occupied with the genus *Erica*, of which 269 out of a total of 409 species are here described. When this important monograph—the joint work of the late Prof. Guthrie and Mr. Bolus—is completed we may notice it at greater length: for the present it is enough to say that what must have been one of the most difficult genera in the whole Flora seems to have been satisfactorily grappled with; the mere making of the keys to the sections, subsections, and species, occupying forty pages, must have been a tedious and difficult piece of work.

We have received a copy of the interesting presidential address on "The History of Botanical Illustration," delivered by Mr. B. D. Jackson at the anniversary meeting of the Hertfordshire Natural History Society in March last. We hope to refer to it later at greater length.

The Trustees of the British Museum have issued a new edition of Mr. Arthur Lister's *Guide to the British Mycetozoa*. This has been brought up to date by the author, and now extends to forty-eight pages. It is, as our readers know, a monograph and the only one existing of the British species, and is fully illustrated. The price—3d.—remains the same as in the earlier edition. The *Guide* can be obtained from the British Museum (Natural History), Cromwell Road, S.W.

A prettily printed *Florula Mortolensis*, "an enumeration of the plants growing wild at La Mortola," has been prepared by order of Sir Thomas Hanbury by Mr. Alwin Berger, the curator of his famous garden. The list contains a few short but interesting notes.

The Trustees of the British Museum have acquired for the National Herbarium a very valuable work by Mr. Worthington G. Smith on the classification of British Basidiomycetes. The work consists of five large MS. volumes, together with a series of ink drawings exhibiting the characters of all the genera. Mr. Smith has spent many years of labour on its preparation, and it embodies the ripe experience gained by a life-long study of these forms: no British fungus-flora can in future be considered complete which has not profited by careful collation with it. It has been brought fully up to date, and includes descriptions, with notes as to habitat, of more than 2150 forms. It is thus the natural supplement to the unrivalled series of coloured drawings of Basidiomycetes in the possession of the Botanical Department, and the two together form a unique and fully illustrated fungus-flora.

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The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

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LEICESTERSHIRE MOSSES.

By A. Bruce Jackson.

Twenty years' investigation of Leicestershire bryology has resulted in the addition of over fifty species and varieties to the list of mosses printed in the *Leicestershire Flora*, which was issued in 1886. The following notes represent the field-work done during the period named; Rev. H. P. Reader, Mr. A. R. Horwood, Mr. F. T. Mott, and the writer, being the principal observers. The MS. list of mosses compiled by Rev. W. H. Coleman, which was only sparingly quoted in the *Flora*, has been largely drawn upon for localities in the Charnwood Forest, Ashby-de-la-Zouch, and Twycross districts, where Mr. Coleman and his co-worker, Rev. Andrew Bloxam, made numerous observations. Doubtful records are ignored. I have to thank Messrs. H. N. Dixon, J. E. Bagnall, and W. E. Nicholson for assistance in determining critical plants. An asterisk prefixed to a name denotes a new county record.

Sphagnum cymbifolium Ehrh. Charnwood Forest; Loughborough Outwoods; Buddon Wood; Old John; wood near Staunton Harold; Seale Wood; Nailstone Wiggs. — *S. acutifolium* Ehrh. Bogs in Charnwood Forest; near Whitwick; Beacon Hill; Bradgate Park; Swithland Wood; Loughborough Outwoods; Smoile Wood; Coleorton; Nailstone Wiggs.—*Var. *rubellum* Russ. Charnwood Forest. —*S. cuspidatum* Ehrh. Charnwood Forest.

Tetraphis pellucida Hedw. Gracedieu; woods near Ashby-de-la-Zouch; Nailstone Wiggs; rocks, Bardon Hill.

Polytrichum aloides Hedw. Swithland Wood; Charnwood Heath; Brazil Wood; Staunton Harold; Heather; Twycross.—*P. piliferum* Schreb. Markfield; Swithland; Mountsorrel; Thurcaston; Moira; Twycross.—*P. juniperinum* Willd. Beacon Hill; Swithland Wood; Lount Wood; Quarry near Hanging Hill; Moira; Burbage Common. — *P. formosum* Hedw. Between Thurnby and Houghton; hill above Lowesby Station; Buddon Wood; Benscliff Wood; Seale Wood; Nailstone Wiggs; Burbage Wood. — *P. commune* L. Houghton-on-the-Hill; Charnwood Forest; Smoile Wood; near Twycross.

**Pleuridium axillare* Ldb. Outwoods, Loughborough; Oakley Wood; near Twycross; Congerstone, *Bloxam*; Burbage Wood; Theddingworth.— *P. subulatum* Rab. Blaby; Pelder Tor; Charnwood; Burbage Common; near Theddingworth. — *P. alternifolium* Rab. Twycross; Normanton Turville.

Dichodontium pellucidum Schimp. Near Temple Mill, Twycross.

Dicranella cerviculata Schimp. Near Lount Tunnel; Bardon Hill.—*D. varia* Schimp. Ingarsby; Houghton; Scraptoft; Charnwood Forest; between Desford and Kirby Muxloe; Lea Lane; Castle Donington; Ashby-de-la-Zouch; near Twycross; Burbage Common; Husbands Bosworth.—**D. Schreberi* Schimp. Lea Lane, 1896, *Mott*. — *Var. *elata*. Ditch-bank near Hungarton, 1904, *Horwood*.

Campylopus flexuosus Brid. Sheet Hedges Wood, Groby; Beacon Hill; Charnwood Forest, near the Monastery; Breedon Hill; Twycross; Bardon Hill. — *C. pyriformis* Brid. Bardon Hill; Burbage Common.

Dicranum Bonjeani De Not. Swithland; Newtown Linford; Buddon Wood; Bardon Hill; Burbage Common.— **D. montanum*. Sheet Hedges Wood, near Groby, 1899, *Jackson*.

Fissidens exilis Hedw. Knighton Spinneys; Quenby; Tilton Hill; Baggrave; Old Canal, Edmondthorpe; Twycross; Burbage Common; Theddingworth. — *F. viridulus*. Scraptoft; Thurnby; near Lowesby; Ingarsby; bank near Botcheston; Orton Woods; Normanton Turville. — **F. pusillus* Wils. "Intermixed with *Gynostomum intermedium* by a pond between Branstone [Braunstone] Hall and Leicester, *ante* 1878," *Bloxam MS.* — **F. incurvus* Starke. Bank near Braunstone Church; Evington; Scraptoft; Bushby; Baggrave; Corby Spinneys. — *F. adiantoides* Hedw. Botcheston Bog; Castle Hill fields.

Grimmia apocarpa Hedw. Blaby Mill; Enderby; Stoughton; Billesdon; King's Norton; Baggrave; rocks in Bradgate Park; Botcheston. — *Var. *rivularis* W. & M. Groby. — **G. trichophylla* Grev. Syenitic rocks, Groby Pool; Bradgate Woods; walls, Buddon Wood.

Rhacomitrium aciculare Brid. Charnwood Forest; near Ulverscroft.—*R. protensum* Braun. Charnwood Forest, *Bloxam*. Recorded erroneously in the *Flora of Leicester* as *G. patens*. — *R. lanuginosum* Brid. Wall near Groby; boulder near Botcheston. — *R. canescens* Brid. Charnwood Forest; near Groby, *c. fr.*

Ptychomitrium polyphyllum Fürn. Charnwood Forest; railway embankment between Groby and Glenfield.

Hedwigia ciliata Ehrh. Gracedieu; rocky ground near Groby Pool; Swithland Slate-pits; rocks on Charley Forest, and on the bark of trees, *R. Pulteney*; rocks at Pocket Gate; Buddon Wood.

Pottia bryoides Mitt. Wanlip; foot-road near S. Croxton, *Beeby*; Sheet Hedges Wood; clay-pit near Botcheston; near Ashby; Twycross; gravel-path, Normanton Turville.—*P. intermedia* Fürn. Groby Road; Old Humberstone; Scraptoft and district; Charnwood Forest; Whetstone; Normanton Turville; Burbage Common; wall near Narborough Station; Husband's Bosworth; Theddingworth. — *P. minutula* Fürnr. Groby Road, Leicester; between Thurnby and Scraptoft; field near Swithland Wood; Woodhouse; Botcheston; Twycross.—*P. lanceolata* C. M. Scraptoft; Groby Road; Hinckley Road, Leicester; Aylestone Meadows; Keyham; Charnwood Forest; Gracedieu quarries; Buddon Wood; Breedon Cloud Wood.

Tortula pusilla Mitt. Wall, Oadby; mud-capped walls at Old Humberstone, abundant; Crown Hills, Evington; walls at Syston and Queniborough; Thornton. — *Var. *incana* Braithw. Wall at Queniborough. — **T. lamellata* Ldb. Mud-capped wall at Old Humberstone, May, 1900, *Jackson*.—*T. rigida* Schrad. Mud-capped wall, Old Humberstone; Swithland Slate-pits; Theddingworth.—*T. ambigua* Angstr. Old Humberstone; Keuper sandstone, Western Park, Leicester; Syston; Botcheston.—**T. aloides* De Not. Groby

Road, Leicester, 1899, *Jackson*; Breedon Hill. — *T. muralis* var. *rupestris* Wils. Glenfield; Blaby; Ingarsby; Scraptoft and district; Newtown Linford; Newtown Unthank; Buddon Wood. — Var. *æstiva* Brid. Wall at Hinckley.—*T. subulata* Hedw. Scraptoft and Stoughton; Charnwood Forest; Swithland Slate-pits; Castle Donington; Ashby-de-la-Zouch; near Twycross. — **T. angustata* Wils. Bank at Scraptoft, 1904, *Jackson*. — *T. mutica* Ldb. River Soar, near Birstall; Aylestone; Scraptoft and district; Billesdon; tree-trunks by the Wreake at Brooksby; Baggrave; Botcheston; stones by the Trent at Castle Donington; Twycross; Normanton Turville Park; Narborough; Theddingworth.—*T. lævipila* Schwgr. Stoughton; Market Bosworth; Theddingworth. — *T. intermedia* Berk. Wall at Birstall; Old Humberstone; walls between Ingarsby and Houghton; bridge near Thurcaston Church.—*T. ruralis* Ehrh. Husband's Bosworth; Hallaton. — **T. papillosa*. Elm tree, Old Ingarsby; ash tree near Evington Church; elm tree near S. Croxton; Husband's Bosworth.

**Barbula lurida*. Keyham, 1904; Aylestone; Thurmaston, *Horwood*; *Beeby*, 1905; *Jackson*. — *B. rubella* Mitt. Humberstone, *Beeby*; Baggrave; Blackbrook; Swithland; Normanton Turville.— **B. tophacea* Mitt. Sand-pit, Glenfield Road, Leicester; near Houghton; Thurnby; Quenby; Billesdon.—Var. *acutifolia* Schimp. Base of wall, Scraptoft. — *B. fallax* Hedw. Near Evington, with a form intermediate between type and var. *brevifolia* Schultz. — *Var. *brevifolia* Schultz. Aylestone, *Beeby*.—*B. cylindrica* Schimp. Knighton Hayes; Keyham; Ingarsby; Baggrave; Tilton Hill; Belvoir Castle Gardens; Botcheston; Castle Donington Park, form with plane-margined leaves; Normanton Turville; Theddingworth. — **B. sinuosa* Braithw. Tree-trunk near Humberstone; Stone bridge, Ingarsby; Lowesby, apparently a starved form with leaves narrower than in the type; wall by stream, Normanton Turville; Aylestone. — **B. Hornschuchiana* Schultz. Bardon Hill, 1903, *Horwood*. — **B. revoluta* Brid. Keuper sandstone, Western Park, Leicester; Oadby Church wall; canal bridge near Market Harborough. — *B. convoluta* Hedw. Ansty; Swithland; Copt Oak; wall at Belton; Cropstone; Thurmaston.

Weisia crispa *var. *aciculata* Dixon. On Keuper marl near Keyham, 1904, *Horwood*. — **W. rostellata*. Cropston Reservoir, 1894, *Mott*.—**W. squarrosa* C. M. Bank near Blaby, with *Funaria hygrometrica*, *W. A. Vice*; Twycross; Market Bosworth; Normanton Turville. — *W. microstoma* C. M. Western Park, Leicester; fallow field near Elmstborpe; Charnwood Forest. — *W. viridula* Hedw. Ansty Lane; Scraptoft; Thurnby; Lowesby; Hungarton; Charnwood Forest; Beaumont Leys; Castle Close; Botcheston; Castle Donington; Ashby-de-la-Zouch; Twycross; Normanton Turville.

Cinclidotus fontinaloides P. B. Bradgate Park.

Encalypta vulgaris Hedw. Wall, King's Norton; Tilton Hill; Groby; walls near Buddon Wood. — *E. streptocarpa* Hedw. Stone wall near Hinckley.

Zygodon viridissimus R. Br. Humberstone; Birstall; Oadby; S. Croxton: Theddingworth.

Orthotrichum anomalum Milde. A plant which is possibly the type was found by me on stones at Whetstone, but riper capsules are necessary for satisfactory determination. — Var. *saxatile* Milde. Boulder, Coleman Road, Leicester; King's Norton; Stoughton; Barkby Thorp. — *O. cupulatum* Hoffm. Coping-stones near Ingarsby; stone by the Church, Lowesby; on trees by the Sence near Temple Mill, Twycross. — *Var. *nudum* Braithw. Cosby.— *O. Lyellii* H. & T. Husband's Bosworth. — *O. affine* Schrad. Stoughton; Humberstone; Ingarsby and district; Newtown Linford; Staunton Harold; Gopsall Wood; Thurlaston; Theddingworth; Hallaton.—**O. tenellum*. Scraptoft, May, 1905, *Reader*.— *O. Sprucei* Mont. Ash-tree, Old Humberstone, 1904, *Horwood*.— *O. diaphanum* Schrad. Scraptoft; Billesdon; Aylestone; S. Croxton; Tilton Hill; Botcheston; Normanton Turville; Husband's Bosworth.

**Ephemerum serratum* Hampe. Burbage Wood; Normanton Turville.

**Physcomitrella patens* B. & S. On mud, Old Canal, Edmondthorpe, 1894, *Mott*; Cropston Reservoir; Twycross; banks of the Welland near Market Harborough.

Physcomitrium pyriforme Brid. Knighton; Stoneygate, Leicester; Kirby Muxloe; Ingarsby; Syston; Tilton Hill; Cropston Reservoir; Swithland; Twycross; Earl Shilton.

**Funaria fascicularis* Schimp. Lawn, Normanton Turville, 1896, *Reader*.

Aulacommium palustre Schwgr. Bardon Hill; Beacon Hill; Whitwick Rocks; Smoile Wood; near Twycross.

Bartramia ithyphylla Brid. Swithland Slate-pits, *J. F. Hollings*.

Philonotis fontana Brid. Thurnby; Gracedieu Wood, 1836, *Bloxam*; Swithland Slate-pits and elsewere in Charnwood Forest; near Twycross.

Leptobryum pyriforme Wils. Braunstone Church; greenhouses at Leicester, Knighton Hayes, and Thurcaston.

Webera nutans Hedw. *var. *cæspitosa*. Aylestone Meadows; near Thurnby. — *W. annotina* Schwgr. Lane by Gopsall Lodge, 1845, *Bloxam*; Twycross. — *W. carnea* Schimp. Grounds of Leicester Museum; Ingarsby; near Twycross; Burbage Common; Normanton Turville; banks of the Welland near Theddingworth.—*W. albicans* Schimp. Ditch near Knighton; lane near Ratby; Tilton Hill; Hungarton.

**Bryum inclinatum* Bland. Twycross; field near Elmsthorpe.— *B. intermedium* Brid. Normanton Turville. — **B. erythrocarpum* Schwgr. Birstall Hill. — *B. atropurpureum* L. Whitwick, 1849, *Bloxam MS.*; Twycross. — *B. argenteum* L. var. *lanatum* B. & S. Evington; Belgrave.— *B. pseudo-triquetrum* Schwgr. Wet ground, Aylestone, 1905, *Reader*.

Mnium cuspidatum Hedw. Twycross. — *M. rostratum* Schrad. Braunstone; bank between Thurnby and Scraptoft; spinney near Rothley; Breedon Cloud; Gopsall; Temple Mill, Twycross, 1845, *Bloxam*; in plentiful fruit under the cedar near the Monument,

1846, *Bloxam MS.*—*M. undulatum* L. Birstall Hill; Scraptoft and Thurnby; Baggrave; Charnwood; Lount Wood; near Twycross, c. fr., 1850; Gopsall Wood; Normanton Turville; Theddingworth. —*M. punctatum* L. Ingarsby; Edmondthorpe; Swithland Wood; Ulverscroft; Lount Wood; Staunton Harold; near Zouch Mills; Orton Wood, near Twycross.

Cryphæa heteromalla Mohr. Hallaton, 1874, *Hackney*.

Homalia trichomanoides Brid. Oadby; Scraptoft; Wistow; Baggrave; Tilton Hill; Bradgate; Burbage Wood.

Pterygophyllum lucens Brid. South Wood, Ashby; Bryan's Coppice, Smesby.

Leucodon sciuroides Schwg. Evington; Scraptoft; King's Norton; Baggrave; Charnwood Forest; Groby Pool; Breedon Cloud Wood; Lount Hill; Gopsall; Theddingworth.

Antitrichia curtipendula Brid. Near Kirby Muxloe, *Bloxam*; Twycross, *Bloxam*.

Porotrichum alopecurum Mitt. Stoughton; Keyham; Tilton Hill; Charnwood Forest; Gracedieu; Beaumont Leys; Groby; Lount Wood; Orton Wood; Thurlaston; Burbage Wood; Owston Wood.

Leskea polycarpa Ehrh. Evington; Scraptoft; Baggrave; near Rothley Temple; Barrow-on-Soar; Botcheston; Spring Wood; trees at Temple Mill, near Twycross; Croft; Theddingworth.

**Thuidium recognitum*. Meadow at Aylestone, 1905, *Reader*.

Climacium dendroides W. & M. Aylestone; marshy meadows near the Reservoir and elsewhere in Charnwood Forest, *Churchill Babington*; Groby Pool; Lea Lane; Buddon Wood; east side of Spring Wood, Coleorton; Twycross; Narborough Bog; Normanton Turville; Croft.

**Pylaisia polyantha* B. & S. On hawthorn, hazel, and elder in hedge at King's Norton, fruiting abundantly, February, 1905, *Horwood*.

Camptothecium lutescens B. & S. Baggrave; Swithland Slate-pits, c. fr., *Hollings*; near Burbage.

Brachythecium glareosum* B. & S. Crown Hills, Evington; Queniborough; Anstey Lane; Swithland Wood. — *B. albicans* B. & S. Wall at Oadby; Burbage Common; Thurcaston. — **B. salebrosum* B. & S. Thurcaston, 1892, *Mott*.—*Var. *palustre* Schimp. Wet meadows near Burbage Wood; near Botcheston; wet meadows at Aylestone; Anstey Lane.—*B. rutabulum* B. & S. *var. *robustum* Schimp. Thurnby; Scraptoft; Tilton Hill.—Var. *longisetum* B. & S. Baggrave.—B. rivulare* B. & S. Evington; Baggrave; Swithland; Normanton Turville; Blaby Mill.— *Var. *chrysoleucon*. Baggrave Park.—*B. velutinum* var. *prælongum* Schimp. A form near this on clay near Scraptoft, 1904.—*B. populeum* B. & S. Ingarsby; tree-trunk, S. Croxton; Tilton Hill; Thurcaston Rectory; Buddon Wood; Bardon Hill.—*B. plumosum* B. & S. Swannington, 1860, *Coleman*; Staunton Harold; Temple Mill; River Sence, near Congerstone; Twycross, near Dawkin's Mill; Sibson Wolds, *Bloxam*.—* *B. cæspitosum* Dixon. Tree near Scraptoft; Keyham; Baggrave; Thurcaston; Barrow-on-Soar; Botcheston; Normanton Park; Croft;

Theddingworth; Aylestone.—*B. purum* Dixon. Bank at Quenby, c. fr., Feb. 1904, *Horwood*.

Eurhynchium piliferum B. & S. Field near Evington; Stoughton; Bushby; very fine in copse near Baggrave; Tilton Hill; Ingarsby; Belvoir Castle grounds; Charnwood Forest; Castle Donington; Twycross; Gopsall Wood; Burbage Wood; near Gaitne Bush; Loddington Wood.—**E. speciosum* Schimp. Groby Pool, *Bloxam*; Sibson Wolds, *Bloxam*. — *E. myosuroides* Schimp. Mowmacre Hill; bank near Braunstone Church; tree-trunk near Baggrave; wood near Thurlaston. — *E. striatum* B. & S. Copse, Hinckley Road, Leicester; S. Croxton; Tilton Hill; Charnwood Forest; Castle Donington; Twycross; Burbage Wood; Theddingworth; near Husband's Bosworth.—*E. murale* Milde. Stone near Braunstone; Scraptoft; Stoughton; Hungarton; Groby Pool.

Plagiothecium Borrerianum Spr. Lea Lane, near Ulverscroft; Oakley Wood; near Shepshed. — *P. sylvaticum* B. & S. Near Knighton; near Great Stretton; Old Humberstone; S. Croxton; Swithland; Twycross; Bardon Hill. — *P. undulatum* B. & S. Swithland Wood; Buddon Wood; Lea Lane; Seale Wood; Bardon Hill; Nailstone Wood; Whitwick Rocks; Outwoods.

**Amblystegium varium* Ldb. On wood in ditch near Scraptoft, 1898, *Jackson*; Pelder Tor, 1884, *Mott*; Groby Pool; Thurlaston; Normanton Turville.—*A. irriguum* Hook. Banks of the Soar near Blaby; Ulverscroft. — *A. filicinum* *var. *Vallisclausæ* Dixon. Wet ground near Buddon Wood.

Hypnum riparium L. Fallen tree-trunk near Evington; pond at Humberstone; Hoby; pond at Baggrave; Swithland; Gopsall; near Earl Shilton. Some of the above records probably belong to the var. *longifolium* Schimp.—**H. polygamum* Schimp. Thornton Reservoir; Cropston Reservoir. — **H. stellatum* Schreb. Charnwood; Groby Pool; Newbould, near Coleorton. — Var. *protensum* B. & S. Lower lias clay near Baggrave. — *H. chrysophyllum* Brid. Fallow field near Elmsthorpe.—*H. aduncum* Hedw. Pond, Quenby; Charnwood Forest. — Var. *Kneiffi* Schimp. Ditch near Blaby; Syston; Edmondthorpe; Thurcaston Lane; Cropston Reservoir; Snarestone; near Burbage.— *H. fluitans* L. Aylestone; Edmondthorpe; Groby Pool; pond, Spring Wood; Ashby Wolds; Seale Wood. — *H. commutatum* Hedw. Scraptoft; Tilton Hill, a form approaching *H. virescens* (*H. falcatum* var. *virescens* Schimp.); Normanton Turville. — *H. cupressiforme* L. var. *resupinatum* Brid. Thurnby; Stoughton; Baggrave; Botcheston; Gopsall; Bardon Hill; Burbage Common; Kibworth; Theddingworth. — *Var. *filiforme* Brid. Thurnby; Tilton Hill; Billesdon Coplow. — *Var. *tectorum* Brid. Tilton Hill. — *H. Patentiæ* Ldb. Smesby; Burbage Wood.—*H. molluscum* Hedw. Lias clay near Baggrave; Anstey; Ulverscroft; Breedon Quarries.—*H. palustre* L. Footway, Stoneygate, Leicester; Church-gutter, Evington; Groby Pool; South Wood, Ashby-de-la-Zouch; Nailstone Wood; near Elmsthorpe.—*H. cordifolium* Hedw. Between Newtown Unthank and Kirby Muxloe; Lount Wood; pond at Packington; bridle-road to Blackfordby; Twycross; pond, Burbage Wood. — *H. cuspidatum*

L. Crown Hills, Evington, c. fr.; Billesdon, c. fr. — *H. Schreberi* Willd. Charnwood Forest; Swithland Wood, abundant; woods near Ashby-de-la-Zouch; Bardon Hill; Nailstone Wood.

Hylocomium splendens B. & S. Quenby; Tilton Hill; Swithland Wood; Bardon Hill, c. fr., *Bloxam*; Lea Lane; Theddingworth.— *H. brevirostre* B. & S. Anstey, *J. F. Hollings.*

ARUM MACULATUM AND ITS RELATIONS WITH INSECTS.*

By John Gerard, S.J., F.L.S.

As is well known, *Arum maculatum* is habitually visited by *Psychoda phalænoides*, a small dipterous insect, of which specimens are almost always to be found in the chamber formed by the lower portion of the spathe, sometimes in large numbers. The story of their relations with the plant has frequently been narrated—in Germany by Hermann Müller, Knuth, and others; in our own country by Lord Avebury, and many popular writers who have told his tale as their own. There are, however, various reasons for thinking that the truth of the matter is of a darker and more tragic character than we should thus be led to suppose.

It need hardly be said that the inflorescence of the *Arum* is borne on a central spadix within the chamber, open only at the top, lying at the base of the large involucre or spathe, which contracts just above it, and then expands upwards into the well-known hood, open in front, wherein is displayed the purple knob in which the spadix terminates. At the bottom of the spadix are found the female flowers arranged in a dense cluster around the central column; above them are the male flowers, their anthers almost sessile, in a similar ring. The upper female flowers are usually infertile, and terminate in long filaments. Above the male flowers is another ring of filaments, generally regarded as staminodes, or abortive stamens, which are situated in or near the narrow throat leading into the basal chamber. These filaments are frequently described as stiff hairs or bristles, and are said to point downwards, so as to permit the ingress of insects, but preclude egress, like the spikes of an eel- or lobster-pot.

According to Müller, who tells the story most fully, the *Arum* is incapable of self-fertilization, being proterogynous, so that by the time when the stamens begin to shed their pollen the pistils are no longer capable of being fertilized;—from which it would follow that the first *Arum* of the season in any locality must remain barren. The *psychodæ*, however, attracted either by the "foul ammoniacal odour" emitted by the plant, or by the prospect of shelter or warmth—(the *Arum* is said to produce heat in a sensible degree)—enter the chamber, and, having done so, are compelled to make a

* The substance of an address at the Linnean Society, June 15, 1905.

prolonged stay, on account of the *chevaux de frise* barring their exit. Müller declares that he has watched flies endeavouring to escape, but always driven back by the "sharp points" of the hairs. Knuth, acknowledging that the flies are small enough to crawl between the hairs, says that they always attempt to escape by flying, and so fail. Presently the papillæ of the stigmas wither, when each pistil bears a drop of honey "to reward the little visitants." Then the stamens dehisce and send down showers of pollen, with which the insects cannot fail to be dusted, and thereupon the obstructive hairs wither and leave an open road to the outer air, of which the psychodæ avail themselves to issue forth, plunging forthwith into another *Arum*-hood, as according to Knuth they invariably do when artificially released. In their new prison-house they find the pistils ripe, and the pollen they import with them effectually secures cross-fertilization.

The difficulties of this account revealed by observation are the following:—

In the first place, the obstruction caused by the "hairs" is not such as of itself to prevent the insects from escaping. The hairs are not stiff or sharp; they do not point consistently downwards; frequently they are not in the narrow throat of the tube; they are so far apart as to leave ample room for such small insects to pass between them; and they never extend to the walls of the chamber, leaving a free passage in that direction. Moreover, it is clear that as a matter of fact the flies *can* find their way out, and sometimes they do so. If a bell-jar be placed over an *Arum*, it is found that the insects immediately come forth and fly about, sometimes covering the interior of the glass. The "hairs" of the plants chosen for experiment were in full vigour, and some insects were seen to make their way out by struggling through; but the glass made such observation rather difficult. A few flies have also been observed to issue from a spathe not so enclosed, making their way, though not without difficulty, through the maze of hairs. It has been found, however, that the great majority attempted to get out by climbing the walls of their prison, but that invariably when they attained a certain height they dropped off and fell to the bottom—and here we encounter the darkest feature of the story.

The truth seems to be that the plant drugs the insects, reducing them to a state of imbecility, which is the true cause of their inability to get away, and that finally they not only die from the effects of the treatment, but their succulent portions are absorbed by the *Arum*, which thus claims to rank as carnivorous. The flies found in young plants recently opened are frequently very brisk and lively; in older plants they crawl or sprawl helplessly; in plants older still there is often nothing remaining to represent them but wings and other hard and indigestible portions, which frequently form quite a considerable layer at the bottom. Not uncommonly corpses are fast stuck to the extremity of the pistils, the draught prepared for their recompense having apparently proved fatal.

Finally, it may be questioned whether the incapability of self-fertilization on the part of the *Arum*, which lies at the root of the

whole matter, is sufficiently authenticated. Certainly it is not universal, for cases have been observed in which the papillæ were still functional while pollen was being freely shed; and in many other instances, although the pistils had passed the point at which they could be fertilized, they had clearly done so but very lately, while the amount of pollen accumulated seemed to indicate that it must have been falling much longer. This is evidently a point which deserves fuller examination, and to which the attention of field-botanists may profitably be directed.

THOMAS CLARK AND SOMERSET PLANTS.

By H. Stuart Thompson, F.L.S.

Since the publication in this Journal for 1898 (311–313) of some notes upon the botanical work in Somerset and biography of Thomas Clark (1793–1864), the whole of his valuable herbarium has been presented to me, and it is now proposed to draw up a list of those Somerset species in the herbarium which are unrecorded for a particular county division in the Rev. R. P. Murray's *Flora of Somerset*, or which confirm certain records by Clark's friend the Rev. J. C. Collins in Watson's *New Botanists' Guide* and *Supplement*, 1837, upon which some doubt had been cast. Plants coming under the first heading are preceded by *, those under the second by C.

It should be explained that prior to the publication of the *Flora of Somerset* I had in my possession a certain number of the more interesting plants from the Thomas Clark collection, most of which are duly quoted in the *Flora*; these are not repeated in the present list. Some of the more interesting records from Steart Island, at the mouth of the River Parret, and from the Steep Holm off Weston-super-Mare are included, though a few of these are already noted in the *Flora of the Bristol Coal-field* by Mr. J. W. White. The number preceding the year of collection indicates the county division as adopted by the Rev. R. P. Murray.

My thanks are due to Mr. Arthur Bennett for kindly examining all the Violas and Potamogetons, to Mr. Pugsley for looking through the Fumarias, to Mr. C. E. Salmon for examining the Statices, and to Mr. J. W. White for help with one or two critical species.

Ranunculus Drouetii Godr. Malt Shovel Lane, near Bridgwater; 3, 1821.—**R. arvensis* L. Near Piper's Inn; 5, 1821.

**Helleborus viridis* L. Seven Wells Coombe; 2, 1840.

Aconitum Napellus L. Near Wiveliscombe; 3, 1825. This is in the same district and on the same stream as Clark's record in N. B. G. and in Hooker's Brit. Flora; and it is also close to Croford, whence came Crotch's specimen in Herb. Watson. The plant is spreading down the stream below Milverton.

Papaver Argemone L. Burnham, a little northward of the Pump-room; 8, 1836. — *P. hybridum* L. Kilve, on the brow of the sea-cliffs; 2, 1849.

Meconopsis cambrica Vig. Cheddar Cliffs; 9, 1824.

**Fumaria Boræi* Jord. Lane by Enmore Church; 3, 1835. As *F. Boræi* does not occur in Fl. Som., Mr. Pugsley suggests that this species has been confused with *F. confusa* and *F. muralis*, particularly as *F. Boræi* is much the commonest species in North Devon.

Sisymbrium Sophia L. Steart Point; 2, 1818. Also Steart Marsh, as quoted in Fl. Som.; 2, 1824. Burnham, at back of the Pump-room; 8, 1836. These early records are inserted because they bear upon the question of the possible introduction of the plant in Somerset (see Fl. Som. p. 27).

Brassica campestris L. The Steep Holm; 9. 1832. Collins' record in N.B.G. of *B. oleracea* from "Berrow; Brean; Steep Holmes" still requires confirmation. Clark's specimen of *B. campestris* has the robust habit of *B. oleracea*, but is certainly not that species.

C. *Diplotaxis tenuifolia* DC. Walls of Taunton Castle Yard; 3, 1829. The plant still grows there.

Cakile maritima Scop. Steart Island; 2, 1817.

Viola flavicornis Sm. = *V. canina* L. = *V. ericetorum* Sch. Burnham Sandhills; 8, 1836. Mr. A. Bennett says of one sheet, "perhaps the var. *sabulosa*." There is a specimen of the beautiful white-flowered variety grown from Turfmoor seed, 1822; which confirms the opinion of the author of the *Flora of Somerset*: "It seems to be very constant in its character, having been noticed by both Collins and Clark."

Saponaria officinalis L., with single flowers, this being a rare state in Somerset. Berrow; 9, 1824.

Stellaria glauca With. Turfmoor; 8, 1831. This confirms Clark's record in Proc. Som. Arch. & Nat. Hist. Soc. 1856.

Arenaria serpyllifolia L. Steep Holm; 9, 1836.—C. *A. peploides* L. Steart; 2, 1829. Steart Island; 2, 1824.

C. *Lepigonum marginatum* Koch. Steart Island; 2, 1824.

Hypericum Elodes L. Turfmoor, about a mile east of Ashcot Railway-station; 8, 1863. Confirms Clark's record in Proc. Som. Arch. Soc. Murray says, "Not seen of late years."

**Tilia cordata* Mill. Halswell; 3, 1824.

C. *Linum angustifolium* Huds. Roadside near Shurton Bars, *Collins*; 2, 1835.

C. *Erodium moschatum* L'Hérit. Middlezoy, *Collins*; 5, 1838.

**Medicago denticulata* Willd. Puriton Scars; 8, 1821.

Trifolium subterraneum L. Keynsham Lodge Park; 10, 1826.—**T. maritimum* Huds. Shurton Bars, *Collins*; 2, 1835.

Vicia lutea L. Glastonbury Tor Sandpit. Clark's last specimen was gathered in 1836. — *V. hybrida* L. Glastonbury Tor Sandpit. The only specimen was gathered in 1832. I have seen only one other Glastonbury specimen, *viz.* that in the British Museum. Both species have long since become extinct.—**V. lathyroides* L. Steart, *Collins*; 2, 1835.

N.C.R. *Lathyrus latifolius* L. Ivythorn Hill; 8, 1853. Quite distinct from the broad-leaved form of *L. sylvestris*, "Var. 2 of Withering," which John Clark gathered on the sea-cliff between

East and West Quantoxhead in 1847. Leaflets 1 in. wide, 2–2½ in. long, elliptic; stipules broader than in *L. sylvestris*; flowers larger and more numerous.

Potentilla argentea L. As suggested in Fl. Som. p. 126, the record "Frequent round Bridgwater, *Collins*" in N. B. G. is certainly an error, for the district both east and west of the River Parret is not at all a likely one for this plant; there is no specimen in Herb. Clark, and it may be expunged from the county list. Collins' error in recording *P. verna* from the same district was noted by me in Journ. Bot. 1898, 313. I saw it this Easter (1905) on rocky ground by the road from Axbridge to Cross, sixteen miles from Bridgwater; but it is quite scarce even on the Mendip limestone.

**Rosa rubiginosa* L. Cannington Park; 3, 1830. Wick Hill, near Langport; 3, 1829. — **R. dumetorum* Thuill. Near Bridgwater; 3, 1830.

C. *Pyrus torminalis* Ehrh. Roadside between Fourforks and Barford House; 3, 1835. This confirms Collins' record of "Spaxton" in N. B. G.

C. *Chrysosplenium alternifolium* L. Cannington Brook, near Charlinch, *Collins*; 3, 1836.

**Ribes rubrum* L. Copse, West Bower; 3, 1849.

Epilobium angustifolium L. Turfmoor; 8, 1826. It may be interesting to place on record an early appearance of this plant on the Somersetshire peat moors, it having increased there so much, as elsewhere in Britain. Clark wrote: "When the Glastonbury Canal was dug, it appeared a year or two afterwards in great plenty on the banks."—*E. parviflorum* var. *β rivulare* Wahlenb. Roadside between Spaxton and Barford; 3, 1852. — *E. tetragonum* L. Holford Combe; 2, 1849. No certain record has been published for this division.

**Œnothera odorata* Jacq. Burnham Sandhills; 8, 1859. This appears to be the first record of the introduction of this Patagonian plant in Somerset. Mr. E. Cleminshaw saw it on Brean Down in 1869 or 1870. In 1898 it was well established just north of Burnham, though extremely scarce during the previous fifteen years. See Journ. Bot. 1905, 62.

Eryngium maritimum L. Steart Island; 2, 1824.

C. *Smyrnium Olusatrum* L. Mount Radford; 3, 1824. This is Collins's record, "Plentiful on Wembdon Hill." It is now confined to a large patch on a mass of New Red Sandstone, through which the high road was cut.

Cicuta virosa L. There are specimens from Burtle Moor, gathered in 1831, 1850, and 1858; and, although the writer found a few plants near Shapwick in 1888 (see Journ. Bot. 1889, 183), we fear this rare but very poisonous plant has become eradicated, perhaps through the cutting of the peat.

Anthriscus vulgaris Pers. Burnham Sandhills; 8, 1835.

Œnanthe pimpinelloides L. Kingsland, Wembdon; 3, 1854. This plant is remarkably common in central and western Somerset, especially on the New Red Sandstone and on Lias. Meadows and

pastures near Bridgwater are occasionally white with the flowers.—*(E. Lachenalii* C. Gmel., which Clark has from Perry Green, Wembdon, 1853, and which Collins recorded from the same district, is also frequently found on the alluvial plain on both sides of the tidal river Parret. The lower part of the stems is usually reddish, a fact not mentioned by Babington or Hooker. — *(E. Phellandrium* Lam. There are some specimens of *(Enanthe* without specific name from Burtle, 1858, which bear a considerable resemblance to weak forms of *Œ. fluviatilis*; but Mr. White thinks they must come under *Œ. Phellandrium.*

C. *Galium tricorne* Stokes. Cornfield adjoining the beach at Shurton Bars, *Collins*; 2, 1835.

Dipsacus laciniatus L. Malt Shovel Lane, Bridgwater; 3, 1829. This plant has the usual involucral bracts (of *D. silvestris*) curved upwards, from 2 to 3 in. long, but the leaves are extraordinary. The third pair are dentate-serrate, the next above are pinnatifid, and the top pair are deeply and irregularly pinnatifid, the larger dentations being an inch deep, with small branches in the axils of the two uppermost leaves. I think it comes best under *D. laciniatus* L.

Scabiosa Columbaria L. With *white* flowers, Uphill Churchyard, *Heneage Gibbes*; 9, 1846.

Erigeron acris L. Steart Island; 2, 1824.

Artemisia maritima L. Steart Island and Steart Marsh; 2, 1824.

C. *Onopordon Acanthium* L. Near Berrow Church; 9, 1834. The plant still exists at Berrow.

Hieracium. I have not yet had an opportunity for investigating the numerous *Hieracia* in this collection; and the same applies to *Salix.*

Tragopogon porrifolium L. Yatton Railway-station; 9. 1853.

Campanula glomerata L. var. *nana.* Collard Hill; 5, 1834.

Specularia hybrida DC. Cornfield near Kingweston; 8, 1831. "Only one plant," in 1880, recorded for the division in Fl. Som.

C. *Vaccinium Oxycoccus* L. Turfmoor, near Burtle; 8, 1841. Confirms Collins' record of 1836, Gapper's "Turfmoor, now very rare" in N. B. G. 1835, and the earlier one of Sole in the *Botanists' Guide.* Not found on the moor for many years, though it should still occur in places on the Sphagnum.

Statice Limonium L. Field between Highbridge and Burnham; 8, 1827.—*S. auriculæfolia* Vahl. Garden, 1832; plant from Steep Holm; 9. This confirms Collins' record. I have recently unearthed a very good specimen of this very rare plant in Somerset, which I gathered in Aug. 1886, on the sea-wall south of Burnham *; 8.

Primula veris* × *vulgaris.* Field near Ruborough Encampment; 9, 1850. Leaves small. —P. vulgaris* Huds. var. *caulescens* Koch? Shaded bank near Enmore Hill; 3, 1826. Some stems have one flower; others have several leaves overtopping the flowering stems.

Anagallis tenella L. Near Wiveliscombe, 1825.

Samolus Valerandi L. Watery place on the sea-cliff between East and West Quantoxhead; 2, 1847.

Erythræa Centaurium Pers. With white flowers. Roadside between Banwell and Sidcot; 9, 1834. — *E. littoralis* Fr. As suggested in Fl. Som., Collins' Brean Down record is probably a mistake. There is no specimen in Herb. Clark, nor has the plant been found elsewhere in the county.

Lithospermum purpureo-cæruleum L. "Puriton Sears Coppice! *T. Clark*" in Fl. Som. should read "Puriton Scars Coppice (1821)." This is probably the same "Copse between Bridgwater and Pawlett" from which Collins recorded the plant. It is on the border of Divs. 5 & 8. "Copse between Piper's Inn and Walton Windmill, 1835, *T. Clark*," may be the thicket on Polden, in the parish of Compton Dundon, quoted in Fl. Som. For an interesting paper by Mr. J. W. White on the life-history of this beautiful and very local plant see Journ. Bot. 1884, 74.

**Cuscuta europæa* L. Roadside, Butleigh, near Street (on a Labiate); 8, 1848.

C. *Atropa Belladonna* L. Lilstock, on the border of the sea-beach; 2, 1834. Still there!

C. *Hyoscyamus niger* L. Cannington Park Quarry; 3, 1824. Seen there by H. S. T. in 1897; also in waste ground at Bridgwater, 3.

Verbascum Blattaria L. By the path leading from Lower Leigh to Overleigh, in the field called Six Acres; 8, 1829. Most of the Somerset records are from walls about villages.

C. *Melissa officinalis* L. Malt Shovel Lane; 3, 1827. This confirms Collins' Wembdon record in N. B. G. The plant was lost years ago through building operations.

**Nepeta Cataria* L. By the Friends' Burying Ground near Taunton; 3, 1827.

**Stachys ambigua* Sm. Durleigh, in two stations; 3, 1821. Identical with Surrey specimens of H. C. Watson's in Herb. Thos. Clark.

Lamium amplexicaule L. St. Matthew's field, Bridgwater; 3, 1821. —C. *L. incisum* Willd. Clevedon, *Collins*; 9, 1842.

Chenopodium polyspermum L. *α spicatum* Moq. Bridgwater, 1851; Turfmoor, 8, 1862.—*β cymosum* Moq. Edington Burtle; 8, 1836. This species is given in aggregate in Fl. Som. — *C. ficifolium* Sm. Edington Burtle; 8, 1836.—*C. murale* L. Edington Burtle; 8, 1836. Brean Down; 9, 1826.— **C. urbicum* L. Edington Burtle; 8, 1836.

**Beta maritima* L. River's bank (Parret), by Turnpike; 3, 1823.

C. *Suæda maritima* Dum. Steart Island; 2, 1817.

C. *Salsola Kali* L. Steart Island; 2, 1817.

**Polygonum minus* Huds. Turfmoor; 8, 1859. This confirms Sole's doubted record of 1782. Rediscovered in 1892 by Mr. J. W. White.

**Rumex limosus* Thuill. = *R. palustris* Sm. North Moor; 3, 1857.

Quercus intermedia. Wood, Holford Combe; 2, 1850. Dr. A. Henry says this is probably the hybrid *pedunculata* × *sessiliflora*, of which there appears to be no record for the county of Somerset.

Euphorbia Lathyris L. Steep Holm; 9, 1832.

Empetrum nigrum L. "Given me by Miss Rosekelly, 8.19.1852, who received it a day or two since from the Quantocks, near Crow-

combe"; 2 or 3 ?, 1852. Hitherto only noted from Dunkery Beacon; and, although the Crowberry extends from Warwickshire (Sutton Park) northwards to the extreme limit of Scotland, it has not been observed to grow south of Birmingham, except in about four places in the west.

**Neottia Nidus-avis* Rich. Enmore Wood; 3, 1821.

Narcissus biflorus Curt. Meadows on the southern side of Cannington; 3, 1847.

**Juncus Gerardi* Lois. Saltmarsh near Bridgwater; 3, 1820. Ditch at foot of Brean Down; 9, 1836. — *J. diffusus* Hoppe. "Somerset," no date. Identical with Rev. E. F. Linton's Norfolk specimens. — **J. obtusiflorus* Ehrh. Between East and West Quantoxhead; 2, 1847. — **J. acutiflorus* Ehrh. Canal between Petherton Park and North Moor; 3, 1857.

C. *Typha angustifolia* L. Wembdon; 3, 1853.

Sparganium natans L. = *S. minimum* Fr. Turfmoor; 8, 1836.

Triglochin palustre L. and *T. maritimum* L. Steart Island, 1824.

C. *Ruppia spiralis* Hartm. Saltmarsh at the eastern end of Brean Down; 9, 1836. Named *R. maritima* by Collins and Clark.

Potamogeton natans L. Pond at Halesleigh, Bridgwater; 3, 1853, —*P. polygonifolius* Pourr. Turfmoor near Burtle; 8, 1848. — *P. lucens* L. River Brue near White House, and near Street; 8, 1833. —**P. perfoliatus* L., form. River Brue near White House; 8, 1859. — *P. crispus* L. Burnham, ponds in the meadows opposite the Pump-room; 8, 1836. — *P. densus* L. Near Walton; 8, 1863. —*P. pusillus* L. Turfmoor; 8, 1836.—**P. pectinatus* L. Chilton Trinity; 3, 1858.

Rhynchospora fusca R. & S. Old decoy pool near Meare, *Dr. Gapper*; 8, 1832. This is not far from the Shapwick part of the moor whence Clark obtained specimens in 1857; in Sole's MS. Flora of 1782 it appears from "Burtle Moor near Mark."

**Scirpus lacustris* L. Ford Gate; 3, 1857. — *S. maritimus* L. Turfmoor; 8, 1857.—Var. *compactus* Koch. Ditch at foot of Brean Down; 9, 1835. I have specimens of this variety from Highbridge (Som.), gathered by myself in 1888; from Abbotsbury, Dorset (*Herb. Clark*); and from Hobmoor, York, 1903, where it grows with the type and the var. *monostachys* Sonder, which I also have from Cornwall (*F. H. Davey*) and from Burnham, Somerset, 1886. There is a note on these forms by Mr. A. O. Hume in Journ. Bot. 1901, p. 145.

Carex pendula* Huds. Wood between Kilve Church and East Quantoxhead; 2, 1847. — *C. filiformis* L. There is an additional locality on the peat moor to that quoted in Fl. Som., *viz.* "By a fir plantation belonging to Cousin James Clark"; 8, 1857.—C. paludosa* Good. Meadow between Malt Shovel Lane and Wembdon Church; 3, 1861.

Lycopodium clavatum L. Willsneck; 2, 1863. It is not desirable to publish the exact locality.—*L. alpinum* L. Summit of Dunkery; 2, 1832.

SOWERBY'S DRAWINGS OF FUNGI.

By Worthington G. Smith, F.L.S.

(Continued from p. 215.)

205. Cortinarius (Dermocybe) cinnamomeus Fr. The original has an additional larger example in outline. In reference to the stem there is a note,—"nearly solid when young." There are two other drawings of this species, one of nine examples, the other of two.

206. Agaricus (Collybia) tenacellus Pers. On the original the gills are correctly left white; on the plate the gills and base of stem have been coloured with flake-white; this has now become lead-coloured and misleading.

207. Agaricus (Inocybe) scaber Müll. The original drawing shows six examples in place of the five of the plate; but, although this is a small species, the originals of the large plant and section are $\frac{3}{8}$ in. more in diameter than on the plate.

208. Agaricus (Clitocybe) laccatus Scop. There are three drawings of this species, but no original of the right-hand figure of the plate. The original has two additional figures, one in outline. (See also 187. Sow.)

209. Agaricus (Tricholoma) personatus Fr. There are three sheets representative of this species, one in outline and in part the original of the plate; there is a coloured figure of the smaller specimen and section; over the pileus is written: "Sometimes redder," and at the base of the stem: "ragged." Elsewhere on drawing: "Hornsey wood and Kensington Gardens previous two years strong but a pleasant mushroom tast." The third drawing has "Blewit"—a popular name for *A. personatus*—written at the back; this is correctly named, but Berkeley has written on the face of the drawing, "nebularis"; this is incorrect. The gills are shown separating from the stem, a character of *personatus* but not of *nebularis*, a species which has decurrent gills. Sowerby's plant is the not uncommon livid form of *A. personatus*.

210. Xerotus degener Fr. The original agrees with the plate, except in the section; the gills are twice as deep in the original as in the plate. Four, in place of three gills, are also shown on the drawing.

211. Polyporus spumeus Fr. On the original, near the margin, is a note,—"pile or wood." There is a second well-finished drawing of two views of one specimen and section.

212. Polyporus betulinus Fr.—There is no original of this.

213. Thelephora laciniata Pers. The drawing from which the plate is taken is wholly coloured, and contains two other figures; two uncoloured copies are in the Museum. There is also a partially coloured sketch, not engraved. Behind one pencil drawing are pencil sketches and sections of *Mycenæ*.

215. Clavaria Ardenia Sow. The plate is made up from a coloured drawing. The first club on plate is $1\frac{1}{8}$ in. longer than

the original; second, $\frac{1}{2}$ an in. longer; third is the length of the original, but $\frac{1}{8}$ in. more in diameter above; fourth, $1\frac{3}{4}$ in. longer, and the apex is blunt on the original, but acute on the plate; fifth, $\frac{1}{4}$ in. longer. The prostrate club is upright in the original, $\frac{3}{4}$ in. longer and $\frac{3}{16}$ in. broader above. There is a transverse section of a club on the original, omitted on plate.

221. Agaricus (Hebeloma) mesophæus Fr. The original of this plate is $\frac{1}{4}$ in. longer in the stem. Fries has erroneously named this subject *A.* (*Flammula*) *hybridus* Fr., but it cannot be this species, as Sowerby says in a note, "very glutinous in wet weather;" he also correctly suggests that the plant somewhat resembles "*A. glutinosus*," a plant belonging to the same section with *A. mesophæus*. There is an outline of a large marine alga on the back of the original. There is a second coloured drawing of *A. mesophæus*, containing four figures, with a note, "warmish insipid taste."

222. Agaricus (Mycena) polygrammus Bull. There is an original of this plate and two other drawings; on one drawing is written, "stipes tough"; on another, "tast firm, not unpleasant."

223. Cortinarius (Phlegmacium) cyanopus Fr. There is a good original of this, with one note, "like scotch snuf."

224. Agaricus (Inocybe) sublanatus Fr. There is a very good coloured original of this, not so dark in colour as the plate, and with an additional figure. There is one note, "scattred."

225. Boletus sanguineus With. There are two notes on the original, one "almost like velvet"; the other, "changes very slowly blue or greenish, bright yellow gills and beautiful crimson pileus."

226. Polyporus cæsius Fr. The original is an uncoloured pencil sketch. There is a note which correctly describes the change of colour,—"in handling bruises easily and becomes blue in the place."

227. Trametes odora Fr. There is no original of this.

228. Trametes suaveolens Fr. The original is an uncoloured pencil sketch with a section, the latter is omitted on the plate.

230. Polyporus pallescens Fr. The original is a slight uncoloured pencil outline, with a note, "229 wanted."

231. Polyporus adustus Fr. The original is uncoloured, with the note, "Boletus carpinus alias marginatus I say flabelliformis Batsch."

232. Clavaria fragilis Holmsk., the var. β of Fries. The original is white, not pale salmon as on plate.

233. Typhula phacorrhiza Fr. Made up from two originals; there are sixteen examples on the drawings; six on the plate.

234. Clavaria fusiformis Sow. There is no original of this.

235. Clavaria fusiformis Sow. var. ceranoides Pers. There is an original of this. The lower part of the section on plate is shown attached to the group in the original; the upper part is not on the

drawing. A second slight pencil sketch of this species is on the original and named "var Hornsey." On the proof plate is written: "Gen 10 Clavaria fructification smooth outside mostly club-shaped irregular."

241. AGARICUS (PLEUROTUS) OSTREATUS Jacq. The upper group is from a drawing, with an outline of a specimen 8 in. in diameter. The section at the foot is only a part of the original, and gives an imperfect idea of the drawing; on the original the flesh is grey beneath the cuticle; in the plate cream. The small group is from a second drawing. There are four drawings in all: one represents a fine group of four; another is an uncoloured duplicate drawing, and includes two views of a group of five specimens; behind this drawing is a large pencil sketch of a garden iris.

242. AGARICUS (PLEUROTUS) TREMULUS Schæff. There is an original of this, exclusive of the largest of the five examples on the plate. There is a note,—"parasitical on Auricularia caryophyllea," the present *Thelephora caryophyllea* Pers.

243. AGARICUS (MYCENA) CORTICOLUS Schum. The original has an additional section; there is one note, "stipes varying a little being darker and lighter coloured."

244. PAXILLUS GIGANTEUS Fr. The original is $1\frac{1}{2}$ in. more in diameter and 3 in. taller; there is also a pencil indication of a still larger specimen, and a second drawing and section. There are two notes,—"changes red when bruised" and "fœtid rather."

245. LACTARIUS PLUMBEUS Fr. The upper figure of the plate is only faintly outlined in pencil on the original drawing. Of the pileus Sowerby says,—"greyish brown"; and of gills, "yellowish grey watry white, milk white acrid."

246. AGARICUS (COLLYBIA) MACULATUS A. & S. The original has the well known foxy spotting very different from the plate; there is a second wholly coloured example, and a third with two coloured figures; the two latter drawings are unpublished.

247. MARASMIUS OREADES Fr. The original only includes the right-hand figure and section. The colour of the published plate does not agree with the drawing or proof-plate. There is a note in reference to the stem, "satin-like."

250. BOLETUS SATANAS Lenz. The plate is so unlike the original that Fries was misled by it and named the published figure a var. of *B. lupinus* Fr., a non-British species. The original has a pileus $4\frac{7}{8}$ in. in diameter, and is white in colour; the plate is $3\frac{7}{8}$, and green; the stem is 3 in. in diameter at base, and olive-white in the original; the plate is $1\frac{1}{2}$ in. in diameter, and sooty green. There is none of the crude formality of the plate in the original drawing. There is a note by Sowerby which says, "should not it be mentioned in what respect this differs from *bovinus*"; but Sowerby's illustration of the latter has never been published. The following notes are on the original: "short pores," "tast of common mushroom," and "full of maggots."

252. HYDNUM CORALLOIDES Scop. There is no original of this.

253. Clavaria fragilis Holmsk. There is an original, partly coloured, of the right-hand group with three additional clubs, one with the upper half removed. The clubs at the left perhaps belong to *C. fusiformis* Sow. In reference to the two examples on the extreme left Sowerby says: "more transparent than hybrida." The two upper figures are *Clavaria vermicularis* Scop.; these are facsimiles of the original. The lower middle figure represents *C. ceranoides* P.; there is only a slight uncoloured pencil sketch for this, with an additional figure below.

261. Coprinus micaceus Fr. The original is of the slightest possible character, the only parts coloured being the group of four small examples and the section. Part of the plate seems to be imaginary, and there is no authority for the peculiar base, beyond the small specimens on the left of plate.

262. Coprinus niveus Fr. The plate differs considerably from the original drawing, and on the original there is a section showing the entire length of the stem and another of gills without a stem. The group on the drawing consists of five examples; on the plate there are eight. There are several pencillings of this and allied species of *Coprinus* on the original drawing. On the back is written, "and into a fluid state it drops with them especially on very moist mornings in wet weather" and "as the plant ripens the [*sic*] separate with an elastic force expanding the pileus and dispersing the seeds to a considerable distance often 2 feet or more in circumference when very moist weather &c the lamina decay and drop with the seed as the plant decays." Sowerby's note about "elastic force," and the projection of the microscopic spores of this small soft species of *Coprinus* to a circle of two or more feet in circumference is of course mycological moonshine.

263. Agaricus (Collybia) velutipes Curt. There is a very careful partially coloured original of this; other drawings of the same species are in the Museum collection; one is drawn and coloured with unusual care, with notes as to the velvety stem and its interior. There is one wholly and another partially coloured group.

264. Agaricus (Stropharia) æruginosus Curt. The original of the large figure is much paler in colour, and there are details of the hollow stem and the attachment of the gills, with an outline of another example. Near the pileus is written, "easily peels"; and elsewhere, "something of the tast of turnip tops." There is a second drawing of six figures.

265. Boletus flavus With. The plate is a fair copy of the original. There are five other sketches of the same species, and on the back of one is a coloured group of *Agaricus* (*Mycena*) *rugosus* Fr. On the original is a note in reference to the pileus which says, "gluten mixed with a kind of coloring matter"; another, as to flesh, says, "does not change color"; the "tast" is said to be "triflingly fetid but I think would eat well drest." There is an outline sketch on the back, with a note,—"pores decurrent like aurantius Bull[d] some otherways they were supposed to be different species but I think only casual varieties."

266. Polyporus squamosus Fr. There is no original of this, but there are two small coloured drawings, one of the upper, the other the under surface.

267. Hydnum auriscalpium L. This plate is made up from three drawings; on the drawings are seven figures, four of which are given on the plate. There is in the Museum collection an uncoloured engraved plate different from 267 and unnumbered.

268. Scleroderma vulgare Fr. The original is a partially coloured pencil drawing; the crude unnatural scales seen on the plate are not so badly represented on the original. The upper figure is $\frac{1}{8}$ more in diameter and $\frac{3}{4}$ in. more in height than the copy. The little circle at the bottom of the plate which contains "the powder or seeds mixed with gum arabic" does not occur on the drawing.

270. Cenococcum geophilum Fr. For the nine examples on the plate there are six on the original drawing: the enlarged view on the plate is half as large again as on the drawing, and it differs from it both in drawing and colour.

277. Clavaria pistillaris L. In the original the small example is coloured, the larger not. On the drawing Sowerby has outlined a specimen 10½ in. in height.

278. Clavaria rugosa Bull. and C. coralloides L. The original plate is numbered in error 277. The five lower figures on the plate represent *C. rugosa;* there are seven on the original drawing, with a note, "all on the paper opaque." The upper figure represents *C. coralloides* L., the original for which is a slight and incomplete pencil outline, with a note, "extreemly white and brittle, a little pinkish towards the bottom"; in the plate this "pinkish" colour is blue. There is a second and more finished outline of this species on the same sheet.

281. Agaricus (Tricholoma) gambosus Fr. There are two drawings of this; on one is written, "gills close"; on the other, "smells fœtid." There is a third pen-and-ink drawing, labelled "mouceron Bull$^{d.}$"

282. Agaricus (Galera) hypnorum Batsch. The original has an additional small section.

(To be concluded.)

SHORT NOTES.

Scirpus sylvaticus in Lake Lancashire.—Dr. John Kendall, of Coniston, has sent me a specimen of this plant from a damp woodland bank near the east side of Coniston Water. He tells me he has not found it anywhere else, and it appears to be rare in Lake Lancashire, v.-c. 69, there being no record for it in Baker's *Flora of the Lake District* or in *Topographical Botany*, although it is not unfrequent in some parts of the adjacent counties of Cumberland and West Lancashire.—Albert Wilson.

Cotoneaster microphylla. — It may be worth while recording that *Cotoneaster microphylla* is well established in different parts of Glamorganshire as a wild plant. It occurs in nearly all cases in exposed limestone strata in places where it is impossible to think that it has been planted by human hands. As it is common on the cottage walls, and as thrushes are particularly fond of the berries, it is most probable that the seed has been deposited by them. The plant grows in a limestone quarry at Cornelly, and in a similar situation at Caerphilly.—W. F. Evans.

[Miss Margaret Macdonald sent a specimen of the plant for naming, which she had found at Cornelly, and we are indebted to her for Mr. Evans's note.—Ed. Journ. Bot.]

The Numbering of the Botanical County-Divisions of Ireland. The Moss Exchange Club is preparing a Catalogue of Hepaticæ showing the distribution of these plants in the county-divisions throughout Great Britain and Ireland, after the manner of the *London Catalogue of British Mosses*. A great practical difficulty has arisen in representing the distribution in Ireland. If the numbers used by Mr. Praeger in *Irish Topographical Botany* are used for the Irish county-divisions, then the same numbers will stand for different districts in England and Ireland, and confusion will be sure to result, I think the divisions as arranged by Mr. Praeger are admirable, but that it was a great mistake he did not make his numbers to run consecutively with those of Great Britain. The disadvantages of the plan I propose, to which he referred when adopting his present scheme, are far outweighed by its advantages. We want a numeration which can be used without confusion for the whole British Isles. Mr. Groves used consecutive numbers in his paper on the distribution of the *Characeæ*, and conchologists have done the same in Adams's *Manual of Land and Fresh Water Shells* and Taylor's *Monograph*. Contractions for the county names have been used in Letts's *Handbook of Hepatics* and Rogers's *British Rubi*—a troublesome plan not free from confusion where county names begin with the same letter, and which takes no account of divisions where the county is large. The ideal plan would be a numeration of English and Irish county-divisions according to latitude, as was pointed out by Mr. Praeger in his paper on the subject in this Journal for 1896 (p. 57), but I suppose it is too late in the day to do this. I can see no practical way out of the difficulty but, while adopting the county-divisions of *Irish Top. Bot.*, to re-number them, and, instead of naming them 1 to 40, to name them 113 to 153. It would be useful if a Catalogue were issued of British Flowering Plants with the county-divisions arranged like the *London Catalogue of Mosses*. In that case the revision of numbers I advocate would be essential, and the sooner this or some similar plan is carried out the better. We owe a debt of gratitude to Mr. Praeger for his labours on the distribution of Irish plants, which have done so much to advance the study; but I think he was ill advised in the numbers adopted, and that it is not too late to set this right. I shall be glad to know what others think on the subject.—C. H. Waddell.

CLAYTONIA SIBIRICA. — If *Claytonia sibirica* has not already been recorded for Cumberland, perhaps it might be worth while to mention that I found at the end of June a large plant of it growing apparently very much at home on some shingle in the bed of the river Derwent by Grange in Borrowdale.—W. F. MILLER.

GLYCERIA FESTUCÆFORMIS Heynh.—Last July I devoted two days, in company with Mr. H. C. Marshall, to examining the islands of Strangford Lough, in the hope of extending the known range of this grass. The experience of previous expeditions, and of the first day of the present trip, showed that there was no use in examining islands on which cattle are grazed, and as cattle are brought, by wading, or swimming, or boats, to almost all the myriad islands in the lough, this restriction imposed a strict limitation to the ground worth exploring. We visited eleven ungrazed islands, distributed over some thirty square miles of sea, and found that on all but one of these *G. festucæformis* grows abundantly and luxuriantly. The names of these ten islets are Lythe Rock, Craigaveagh, Green Island Rock, Gull Rock (near Dunsy Island) Dunsy Rock, Black Rock, Swan Rock (in the Quoile estuary), Bird Island (off Kircubbin), Sheelah's Island, and Gabbock Island. The one exception was Dunnyneill, where the shore is too high and gravelly for this grass, which likes a shore where only a few inches of stones cover the boulder clay. We observed that on these islets, which barely rise above springtide level, a constant succession of maritime plants may be noted. Lowest on the beach comes *G. festucæformis*, forming often a band twenty feet wide, and growing two feet high. A zone of *Atriplex* comes next, which is succeeded by one of *Agropyron repens*; above this grows *Festuca ovina* in its dense luxuriant maritime state; and where the ground rises beyond the reach of storm-waves, this gives way to meadow plants, such as *Leontodon autumnalis* and thistles. The grass was in full flower at the time of our visit, and I made a large gathering, which I hope to distribute through the Botanical Exchange Clubs later on.—R. LLOYD PRAEGER.

NOTICES OF BOOKS.

Experiments with Plants. By W. J. V. OSTERHOUT, Ph.D. 8vo. Pp. xix, 492, tt. 253. London: Macmillan & Co. 1905. Price 5s. net.

DR. OSTERHOUT'S *Experiments with Plants* forms the completion of a series of three popular botanical works projected by Professor L. H. Bailey. Two of these, *Lessons with Plants* and *Botany*, have already appeared under Professor Bailey's name, and at his suggestion Dr. Osterhout, Assistant Professor of Botany in the University of California, was entrusted with the third. As in the case of the two preceding books, the production of the present, both in the way of text and illustrations, leaves nothing to be desired. There is

perhaps some danger lest the student rest satisfied with the sketches illustrating experiments in physiology, instead of regarding them as guides to their performance. Similarly, in the first chapter, "The Awakening of the Seed," a smaller number of figures of the actual process of germination would have left more scope for the powers of observation of the student. A propos of the illustrations it would have been well if some indication of relative size had been given. Sketches of apparatus, and stems or leaves of plants on the one hand; details of cell-structure, and reproductive organs of fungi on the other, are given without any indication of the reduction or magnification employed.

There are ten chapters. The first and second deal with the structure of the seed and its germination; the third, fourth, fifth, sixth, and seventh with the work of roots, leaves, stems, flowers, and fruits respectively. Chapter viii., "How Plants are influenced by their Surroundings," is œcological; chapter ix., "Plants which cause Decay, Fermentation, and Disease," deals with bacteria and fungi in their relation to the higher plants and animals; a map of the cholera-stricken district of Hamburg, and the contiguous but comparatively immune district of Altona, affords a striking example of the importance of bacteria from a sanitary point of view. "Making New Kinds of Plants" is the title of the last chapter, an eminently readable one, dealing with the wonderful improvements in economic plants effected by crossing various kinds, and well illustrated by Mr. Burbank's work on plums, Shasta daisies, and other subjects.

We have said enough to indicate the great value of Dr. Osterhout's book, which will not only be of use to the professed teacher and student, but also helpful to intelligent folk in general, who take interest in the world of plants around them.

A. B. R.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on 15th June, the Rev. John Gerard, S.J., F.L.S., exhibited a series of lantern-slides of *Arum maculatum*, in disproof of the statements of Hermann Mueller and others as to the fertilization of this plant by small flies, pointing out that these flies were not imprisoned by the abortive hair-like organs above the stamens, and suggesting that these visitants became stupefied by the nectar afforded by the ovaries, and were digested by the plant. Father Gerard's remarks are given *in extenso* at p. 231. Sir Dietrich Brandis illustrated his paper "Remarks on the Longitudinal Nerves and Transverse Veins in the Leaves of Bamboos" by a series of lantern-slides, displaying the longitudinal nerves of Bamboos, with the transverse veins, the latter easily observed in some species, but in the majority only to be detected by the microscope or after special treatment. These were shown to be useful diagnostic characters in genera which flowered irregularly

and at long intervals. He also exhibited slides from transverse sections of palm-leaves to show the absence of the midrib in such palms as *Phœnix*. A second paper by the same author dealt with "Some Remarkable Indian Undershrubs," whose habit of life had apparently been modified by the effect of annual jungle-fires, *Careya herbacea*, *Erythrina resupinata*, and *Grewia sapida* being specially mentioned. Experiments were now in progress at Dehra Dun, in the area protected from forest fires, and appearances now seemed to show that *Careya* and *Grewia* were changing their undershrubby habit and retaining the above-ground stems from year to year, possibly a reversion to original conditions of life. There was also a paper by Dr. Masters on *Widdringtonia*, treated as distinct from *Tetraclinis*, *Callitris*, *Actinostrobus*, with a revision of the genus and the description of two new species.

"The Country-Side," a recent penny Harmsworth venture, edited by Mr. E. Kay Robinson, is in many ways attractive and, if rightly directed, may be useful. We regret to observe, however, that, probably as an illustration of the need for "thinking imperially," a —we mean "the"—"British Empire Naturalist Association," has been formed, having various "objects," of which the third runs:—"To promote (*a*) sanctuaries of wild life and (*b*) wild-flower farms, where wild plants will be cultivated for distribution to members, and through them to districts where such additions to the native flora would be valued." The editor (in the issue for June 3) takes trouble to emphasize the advantages of this new form of "dumping," which apparently commends itself to his discretion: in answer to a correspondent who fears that the recommendation of "wild flowers worth growing" may lead to their destruction in their native haunts, he writes:—"The fear is, I think, unfounded. Where some readers are inclined to rob the country for the sake of their gardens, it is much better that they should know which kinds are suitable for the purpose, and others will at the same time be encouraged to establish the same kinds in new natural places. Moreover, the restoration of wild flowers to their natural haunts and the introduction of desirable kinds into suitable districts where they do not grow at the present time will be one of the constant aims of the B.E.N.A., and those members who have such plants growing in their own gardens will be best able to assist in the supply of seeds and roots at the proper seasons." It is of course certain that no botanists would dream of establishing plants in "new natural places"; and it is to be hoped that their discouragement may thwart this most mischievous "aim of the B.E.N.A," which is thus further developed in the issue for June 17:—"If those readers who take sufficient interest in the flora of their own neighbourhoods to know which plants are in danger of extinction and what kinds they would like to establish or re-establish there will send us a list thereof, I think that I can promise that they shall be supplied with seed or roots in season. One of the objects of the *Country-Side*, by means of the B.E.N.A., will be to supply every one, who desires to enrich his own garden or the surrounding

country, with the means to do so." It would seem to us that the *Country-Side* might have usefully devoted itself to the instruction of its contributors. In the same number we find the following:—"He we see the little wild strawberry (*Fragaria vesca*) contrasted with its modern garden representative. All are familiar with the former plant, and with its delightful sub-acid taste, so grateful to the palate on a hot June day. But not everyone realizes that many of the finest varieties of cultivated strawberries are the direct descendants of the little wilding. Such, however, is the case, although other varieties have been produced from the hautboy (*F. elatior*)—another specimen (*sic*) of strawberry." We had always understood that the "finest varieties of cultivated strawberries" were the product of yet another "specimen," *F. chiloensis*. We think "the young naturalist" will do better to confine himself to "Our Noah's Ark Competition" and similar delights provided for him by the editor than to trouble about establishing plants in "new natural places."

Banks's Newfoundland Journal, which (see Journ. Bot. 1904, 352) was in the possession of the late Mr. S. W. Silver, has been purchased, with the rest of the York Gate library, by the South Australian Branch of the Royal Geographical Society, Adelaide.

The third volume of Prof. Marshall Ward's series on *Trees* (Cambridge University Press, 8vo, pp. xii, 402, price 4s. 6d. net) deals with "Flowers and Inflorescences." Like its predecessors, it is well printed and well illustrated: technicalities are avoided as far as possible, though the author rightly points out that these are necessary to some extent; a good glossary obviates any difficulty that might arise from their employment. A classification of Willows by characters founded on the male and female catkins respectively forms a useful appendix.

Botanist's Album. — Messrs. W. & A. K. Johnston send a somewhat ponderous quarto volume (price 5s.) containing fifty sheets of plain cartridge paper interleaved with blank plant-schedules of the form familiar to students. The dried plant is fixed to the plain paper, and the corresponding schedule filled up. We think it a rather cumbrous method of rendering educational the collecting of specimens; and that there are better ways of using wild plants to excite the interest and powers of observation of students.

Mr. Garry's *Notes on the Drawings for Sowerby's 'English Botany,'* issued as a supplement to this Journal in 1903–4, have been issued in volume form by Messrs. West, Newman & Co., price 6s. As only a few copies have been published, early application for them should be made. An index of genera has been added.

The second and concluding part of the second supplement to the *Index Kewensis* has just been issued by the Oxford University Press.

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By Spencer le M. Moore, B.Sc., F.L.S.

Among Mr. T. Kaessner's *Rubiaceæ* occur the four novelties hereunder described * from specimens in the National Herbarium.

Oldenlandia Kaessneri, sp. n. Glabra, in sicco fuscescens, caule ascendente pauciramoso, ramis bene foliosis quadrangularibus, foliis sessilibus linearibus vel anguste lineari-lanceolatis obtuse acutis uninervibus longe decurrentibus, stipulis brevibus appendicibus paucis setiformibus terminatis, floribus dimorphis tetrameris in cymis multifloris corymbosis semel vel bis trichotomis longipedunculatis digestis, calycis tubo (ovario) subgloboso limbi alte partiti lobis late subulatis æquilongo, corolla parva infundibulari adusque medium divisa tubo lato quam calycis limbus longiore lobis oblongo-obovatis obtusis acutisve, filamentis nunc abbreviatis nunc longiusculis, antheris subinclusis vel exsertis, stylo florum aliorum exserto aliorum incluso glabro ramis pro rata longis clavellatis papillosis, capsula parva depresse globosa glabra verisimiliter vertice solummodo dehiscente.

Hab. Nairobi. No. 957. (Also same place; *A. Blayney Percival.*)

Probabiliter saltem bispithamea. Folia modice 2·0–3·0 cm. long., et 0·3–0·5 cm. lat. Stipulæ in toto 0·25 cm. long. (setæ 1·0–1·5 cm.). Cymarum pedunculus 3·5–8·0 cm. long. Bracteæ ultimæ subulatæ, ± 0·2 cm. long. Pedicelli summum 0·25 cm. long., sæpius vero breviores. Calyx totus vix 0·2 cm. long.; tubus 0·1 cm. lat. Corolla tota nunc 0·3 cm. long. nunc 0·45 cm.; tubus fere 0·2 cm. diam. Filamenta breviora 0·03 cm., longiora 0·2 cm. long. Antheræ 0·08–0·11 cm. long., oblongæ. Stylus florum aliorum 0·4 cm., aliorum 0·15 cm. long. Styli rami nunc 0·1 cm. long. et revoluti, nunc 0·12 cm. et recti. Capsula 0·15 × 0·2 cm.

Near *O. Johnstoni* Oliv. and its allies. Remarkable for the decurrent leaves and dimorphic flowers.

The long-styled flowers have, so far as my experience goes, always smaller corollas than the short-styled, and anthers on very short filaments. Exserted stamens are possessed by the short-styled flowers. A very interesting plant on account of this heterostylism.

Oldenlandia subtilis, sp. nov. Herbacea, annua, humilis, summum semispithamea, caule tenuissimo ascendente paucifolioso sub lente puberulo, foliis anguste vel angustissime linearibus acutis microscopice puberulis, stipularum parte libera brevissima glanduloso-erosa vel subtruncata, floribus pusillis ex axillis superioribus solitatim raro binatim ortis tetrameris, pedunculis gracillimis calycem longe excedentibus, calycis tubo late turbinato quam lobi subulati ciliolati paullulum breviore, corolla calycem breviter excedente adusque ⅓ diviso lobis oblongo-ovatis obtusis faucibus

* For former papers on Mr. Kaessner's plants, see Journ. Bot. 1902, p. 339; 1903, pp. 155, 361.

pilosulis, staminibus infra fauces insertis filamentis brevissimis, stylo incluso, capsula parva latissime turbinata compressa vertice dehiscente.

Hab. Golunko. No. 781.

Exstant exemplaria modo 3·5–4·0 cm. alt., alia vero 10·0 cm. attingunt. Folia 0·5–1·0 cm. long., sæpissime circa 0·05 cm. lat., rarissime fere adusque 0·2 cm. Stipularum pars libera 0·1 cm. long. vel etiam minus. Pedunculi ± 0·5 cm. long., tandem nutantes. Calyx sub flore 0·16 cm. long., hujus lobi 0·1 cm. Corolla 0·15 cm. long.; tubus 0·1 cm. long., 0·06 cm. lat.; lobi 0·03 cm. lat. Antheræ 0·025 cm. long. Stylus integer, 0·05 cm. long. Capsula 0·12 cm. long., 0·15–fere 0·2 cm. lat.

To be inserted near *O. tenuissima* Hiern, a still more lowly plant, with shorter leaves, smaller calyx-lobes, and a shorter corolla with broader tube.

Pavetta Kaessneri, sp. nov. Fruticosa ramis validis complanatis minutissime pubescentibus deinde glabrescentibus, foliis majusculis distincte petiolatis ellipticis obtusis basi angustatis coriaceis supra nitidis et bullulatis et pilis brevissimis onustis subtus griseo-tomentosis uninervibus nervis lateralibus utrinque circa 14 subtus eminentibus, stipulis latissimis sursum in appendicem subulatam sibi ipsis æquilongam subito desinentibus, corymbis trichotomis sublaxifloris terminalibus (sæpe ramulos ultimos abbreviatos coronantibus), floribus tetrameris, calycis griseo-tomentosi lobis abbreviatis rotundatis obtusissimis, corolla adusque ⅓ in lobos oblongos obtusos divisa tubo utrinque sparsim puberulo faucibus pilosis, antheris breviter exsertis, stylo longe exserto, stigmate clavellato.

Hab. Muka. No. 920.

Foliorum lamina 12·0–15·0 cm. long., 4·0–5·0 cm. lat. (accedunt folia pauca juniora minora e. g. 5·0 × 1·5 cm.); nervulæ eleganter reticulatæ, fac. sup. valde impressæ, fac. inf. eminentes. Stipulæ 0·4–0·5 cm. long. (appendice exempta), extus minute pubescentes. Inflorescentiæ circa 10·0 cm. diam., minute griseo-pubescentes. Calycis tubus (ovarium) turbinatus, 0·15 cm. long.; limbus 0·13 cm. long., hujus lobi modo 0·06 cm. long. Flores verisimiliter albi. Corollæ tubus 1·0 cm. long., humectatus 0·2 cm. siccus circa 0·15 cm. diam.; lobi 0·6 cm. long., 0·2 cm. lat. Stamina faucibus inserta; filamenta vix 0·2 cm. long.; antheræ cito maxime tortæ, 0·4 cm. long. Stylus paullulum ultra 3·0 cm. long.

Easily known by the large coarse bullulate leaves, shining above and tomentose below, together with the somewhat lax corymbs, the very short and broad calyx-lobes, and the 1·0 cm. long. corolla-tube.

Tardavel (*Borreria*) **Kaessneri**, sp. nov. Herbacea, parum elata, caulibus ramisve strictis bifariam pubescentibus, foliis comparate elongatis sessilibus linearibus utrinque coarctatis 1-nervibus hispidulo-scabridis demum scabriusculis, stipulis amplis vaginantibus sursum plurisetosis hispidulis, capitulis axillaribus plurifloris, bracteis linearibus, calycis setulosi lobis 2 (rarius 1) lineari-subu-

latis inter se æqualibus vel paullulum inæqualibus corollæ tubum excedentibus adjectis 2 minimis, corolla calycis lobos excedente adusque medium in lobos lineari-lanceolatos divisa, capsula apice sparsim piloso-hispidula ceteroquin glabra.

Hab. Sani. No. 749.

Planta circa spithamea. Folia modice 4·5–5·0 cm. long., 0·2 cm. (rarissime 0·4 cm.) lat. Stipularum pars basalis 0·4 cm. long.; setæ 7–9, setulosæ, ± 0·3 cm. long. Corolla tota 0·5 cm. long.; lobi 0·25 cm. long., acuti apice barbellati. Antheræ breviter exsertæ, 0·12 cm. long. Ovarium 0·3 cm. long. Capsula 0·4 cm. long., 0·2 cm. lat. Semina oblonga, fusco-purpurea, polita, 0·3 cm. long.

Near *T. scabra* Hiern (*Spermacoce Ruelliæ* DC.), but different in the narrow 1-nerved leaves and in several floral details.

NEMATODE GALLS ON MOSSES.

By H. N. Dixon, M.A., F.L.S.

When recently examining specimens of *Porotrichum alopecurum* Mitt., gathered in 1894 at Becky Fall, Lustleigh, South Devon, I was struck by what appeared to be terminal male flowers on the tips of the secondary branches and branchlets, forming hard, yellow, tumid, bud-like bodies, on some plants very numerous and conspicuous; in one case I counted as many as fifty on a single stem. The apical position, as well as the fact that the stems were fruiting ones (the species being dioicous), of course precluded the idea that they were male flowers, and on dissection they proved to be bodies of a gall-like nature, containing numerous minute Nematode worms, or *Anguillulæ*.

Galls of this nature appear to be very uncommon on mosses—I have only once come across them elsewhere among the many thousands of specimens that have passed through my hands in the last twenty years or more; they have recently been described in two papers in *Hedwigia*, for the references to which I am indebted to Mr. A. Gepp. Mönkemeyer published a short article (*Hedwigia*, xli. Beiblatt 22, 1902) on "*Hypnum fluitans* L., mit Anguillula-gallen"; and again, within the last few weeks, a more detailed article has appeared by Schiffner (*Hedwigia*, xliv. 218, 1905), "Beobachtungen über Nematoden-Gallen bei Laubmoosen." The former writer describes similar galls on *H. fluitans*, and refers to their occurrence on other *Harpidia*, as noted by Warnstorf, especially on *H. aduncum* Hedw. Schiffner adds considerably to the number of species of moss acting as host-plant to the galls, having found them on several species of *Dicranum*, and, what is curious, most of these occurred in quite dry stations, instead of in the aquatic or moist situations which are the usual habitat for these *Anguillulidæ*. He also detected them on *H. cupressiforme*, where they occurred at the apex of the branches; and he points out that

this effectually disposes of the supposition that the galls might originate from male flowers, modified by the infection of the Anguillula. This conclusion is entirely confirmed by the case of the *Porotrichum* now recorded, where the galls all occur at the apex of the ultimate branchlets, where flowers are never produced.

In all probability the Nematode is the same in all these galls, as Schiffner found them to be the same on the various species of *Dicranum*, &c., from which he obtained them; and Mönkemeyer's figures of those in the galls of *H. fluitans* exactly recall those which I obtained from *Porotrichum alopecurum*. Moreover, his description of the alteration in structure produced in the leaves composing the gall in *H. fluitans* agrees exactly with my own observations.

I have on only one other occasion observed anything in the nature of a gall on a moss, *viz.* on a specimen of *Eurhynchium Swartzii* Hobk., gathered in a ditch in Yardley Chase, Northamptonshire, in 1887. The nature of the gall remained at the time undetermined, and the moss was put on one side; but recent examination in the light of the facts described above shows the contents of the galls to be similar, and *Eurhynchium* must be added to the list of those genera already known to be infested by the *Anguillulæ*.

DESMIDS FROM VICTORIA.

By G. S. West, M.A., F.L.S.

Mr. A. D. Hardy, of the Lands Department, Melbourne, Victoria, is very kindly forwarding me some interesting Australian algæ, among which are a number of new forms. He is systematically collecting plankton-material from the Yan Yean Reservoir, from which the city of Melbourne obtains its water-supply, and I hope in a short time to be able to report at length upon these collections. In the meantime, the present note consists of the descriptions of three new species and eight new varieties of desmids, mostly from the plankton.

Pleurotænium mamillatum, sp. n. P. parvum, modice elongatum, cellulis diametro 14–15-plo longioribus; semicellulæ subcylindricæ, leviter et gradatim attenuatæ e medio apicem versus, inflatione subprominenti ad basin et marginibus 10–11-undulatis, undulis gradatim minoribus apicem versus; apicibus convexo-truncatis, verrucis magnis conico-mamillatis subdivergentibus 6–7 (visis 4) instructis; membrana subsparse punctata. Long. 372–442 μ; lat. bas. semicell. 28–31 μ; lat. med. semicell. 27–29 μ; lat. apic. semicell. sine verruc. 17–19 μ, cum verruc. 21–23 μ.

Hab. Yan Yean Reservoir, Victoria; in the plankton and amongst weeds at the margin.

Micrasterias Mahabuleshwarensis Hobson var. reductum, var. n. Var. lobulis inferioribus loborum lateralem multę reductis

brevioribusque. Long. 132 μ; lat. max. 112 μ; lat. lob. polar. 65 μ; lat. isthm. 19 μ.

Hab. Whanregarwen, Victoria.

Microsterias Hardyi, sp. n. M. submagna, paullo longior quam lata, profundissime constricta, sinu valde aperto acutangulo ad extremum angustissimo; semicellulæ trilobæ; lobo polari magno et leviter exserto, parte inferiori angusta cum marginibus subparallelis et cum serie denticulorum circ. 7 intra marginem lateralem unumquemque, apicibus cum verrucis emarginatis binis et processibus minutis brevibus emarginatis duobus asymmetrice dispositis, angulis superioribus in processus longos denticulatos sursum divergentes productis; lobis lateralibus profundissime bilobulatis, lobulis magnis elongatis et divergentibus, denticulatis; apicibus lobulis et processibus lobi polaris 4-dentatis; cum serie denticulorum intra lobulis lateralem et processibus lobi polaris. Long. 200–220 μ; lat. 163–202 μ; lat. isthm. 16·5–17·5 μ.

Hab. Yan Yean Reservoir, Victoria; abundant in the plankton.

Cosmarium tortum Lagerh. et Nordst. forma trigona. Forma cellulis a vertice visis rotundo-trigonis, angulis levissime producto-submamillatis; membrana delicatissime punctata. Long. 21–24 μ; lat. 15–16 μ; lat. isthm. 10 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

Cosmarium capitulum Roy & Biss. var. australe, var. n. Var. ventre semicellulæ minore, angulis capitulis leviter sursum divergentibus. Long. 16–19 μ; lat. 20–23 μ; lat. isthm. 5·5–6 μ; crass. 8·5–9 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

Cosmarium Hardyi, sp. n. C. mediocre, circiter 1½-plo longius quam latum, modice constrictum, sinu breviter lineari extremo ampliato et extrorsum valde aperto; semicellulæ subsphærico-semicirculares, apicibus levissime truncatis et glabris, lateribus et angulis inferioribus late rotundatis granulis minutis instructis, intra margines laterales et infra apicem granulis minutissimis instructæ; in parte mediana semicellularum cum scrobiculis confertis quincuncialiter ordinatis; a latere visæ subsphæricæ; a vertice visæ late ellipticæ et latissime tumidæ utrobique. Long. 85 μ; lat. 57 μ; lat. isthm. 21 μ; crass. 50 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

Staurastrum lævispinum Biss. var. subbrachiatum var. n. Var. processibus angustioribus basin versus et sæpe emarginato-furcatis ad apices. Long. sine proc. 17–18·5 μ, cum proc. 30–35 μ; lat. 11–12 μ, cum proc. 30–32 μ; lat. isthm. 6·5–7 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

Staurastrum nudibrachiatum Borge var. Victoriense, var. n. Var. apicibus processuum integris, rotundato-conicis; semicellulæ a vertice visæ 10-radiatæ; processibus paullo angustioribus. Long. sine proc. 45–46 μ; lat. sine proc. 35–36·5 μ, cum proc. 79–96 μ; lat. isthm. 31 μ; crass. proc. 4·8–5·8 μ; long. proc 25–34 μ.

Hab. Yan Yean Reservoir, Victoria; in the plankton and amongst weeds at the margin.

STAURASTRUM PATENS Turn. var. PLANCTONICUM, var. n. Var. paullo minor, angulis leviter productis trispinatis; semicellulæ a vertice visæ lateribus subrectis, angulis leviter productis et trispinatis. Long. sine spin. 32 μ, cum spin. 52–56 μ; lat. sine spin. 38–44 μ, cum spin. 58–66 μ; lat. isthm. 11·5 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

STAURASTRUM MUCRONATUM Ralfs var. DELICATULUM, var. n. Var. semicellulis elliptico-fusiformibus, angulis lateralibus submamillatis et apiculatis. Long. 32·5–35 μ; lat. 34–37 μ; lat. isthm. 6–7 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

STAURASTRUM MUTICUM Bréb. var. VICTORIENSE, var. n. Var. cellulis longioribus quam in forma typica; semicellulis late ellipticis; membrana delicatissime punctata. Long. 30 μ; lat. 20·5 μ; lat. isthm. 7·5 μ.

Hab. Yan Yean Reservoir, Victoria (plankton).

NOTES ON CARDAMINE.

By EDMUND G. BAKER, F.L.S.

I.—CARDAMINE CHILENSIS DC.

THIS plant was described by Aug. De Candolle (Syst. Nat. ii. 254 (1821)) from specimens collected by Ruiz & Pavon, and preserved in Herb. Lambert; they are now in the National Herbarium, and are written up by De Candolle. As the species has been misunderstood by several subsequent writers, including Barneoud, Reiche, and finally O. E. Schulz, the monographer of the genus, it may be well to give a short description of the true plant. Probably the initial mistake was made by Bertero, who in his herbarium (no. 146), in 1835, distributed specimens from Mt. Leone, near Rancagua, as *Cardamine chilensis* DC. Hooker and Arnott (Bot. Misc. iii. 137) named a plant gathered by Cuming at Valparaiso (no. 603) *C. hirsuta* L. var. *simplicifolia*; this is very closely allied to the plant of Bertero. Dr. O. E. Schulz in his monograph* quotes and figures the plant of Bertero as *C. chilensis*. He places *C. hirsuta* L. var. *simplicifolia* Hook. & Arn. among his "species incertæ"; the Cuming no. 603 cited by Hooker & Arnott he includes under his var. *angustifolia*; and places under var. *simplicifolia* "Cuming 630" —a misquotation of the number originally given.

The true *C. chilensis* of De Candolle, as is shown by his very full description, which I have compared with the original, is an ally of *C. africana* L., which Dr. Schulz places in his Sect. *Papyrophyllum*. The leaves are trifoliolate, with a petiole 1·5–4·0 cm.

* "Monographie der Gattung Cardamine," in Engler, Bot. Jahrb. xxxii. pp. 280–596.

long, the leaflets are ovate-lanceolate, irregularly serrate, the lateral unequal at the base and very shortly petiolulate, the terminal more longly petiolulate; whereas in the *C. chilensis* of Bertero and other authors the leaves are either simple or 1–2-jugate, the terminal leaflets being obovate and either entire or crenate-repand.

Good material, correctly determined, was collected by Ernst at Galipan, no. 1104. From this it appears that the peduncles extend from 3–4 cm., as stated by De Candolle, to 20 cm., and are sometimes more than 7–8-flowered. Barneoud, who is responsible for the *Cruciferæ* in Gay's *Fl. Chilena*, has followed Bertero in his erroneous determination of the species, as he describes the leaves as "3-lobatis vel simplicibus obovatis"; and Dr. Reiche in the more recent *Flora de Chile* evidently has the same plant in view.

Some difficulty presents itself as to the name that should be adopted for *C. chilensis* Bertero, non DC. Dr. Reiche considers *C. Solisii* Phil. Anal. Univ. 1865, p. 325, synonymous with the plant he describes as *chilensis*, and he places *C. valdiviana* Phil. Anal. Univ. 1865, ii. p. 314, as a variety of this species.

Dr. O. E. Schulz retains both *C. Solisii* Phil., a little-known plant which was collected near Chillan by M. de Solis, and *C. valdiviana* Phil. as separate species, but unites with his *C. chilensis* as a variety *C. nana* Barn. apud Gay, Fl. Chilena, i. 108 (1845). The principal difference between the *C. chilensis* of Bertero and *C. nana* Barn. is, if one may judge from the descriptions of the two species, that in the former the raceme is more or less bracteate, whereas in the latter the raceme is either only bracteate at the base or non-bracteate.

II.—Cardamine virginica L.

Dr. O. E. Schulz takes as the type of his *Cardamine parviflora* L. subsp. *virginica* (L.) the plant described by Linnæus (Sp. Pl. 656) as *C. virginica*. The previous history of this species may be briefly stated. In 1810 Poiret (Encycl. Meth. Suppl. i. 413) transferred it to *Arabis*, and included *C. virginica* Michx. as a synonym. In 1838 Torrey & Gray (Fl. N. Amer. i. 85) took Michaux's plant as the type of their *C. hirsuta* L. var. *virginica*, placing the Linnean *C. virginica* as a doubtful synonym. Dr. Robinson in 1895 (Synop. Flora, i. 161) placed it as a synonym of *Arabis Ludoviciana* C. A. Meyer. In the "List of Plants of Arkansas" (Ann. Rep. State Geologist for Arkansas, 1871) Prof. Trelease suggested that this name should become *A. virginica* (L.), and this suggestion is adopted by Britton & Brown (Illustr. Flora, ii. 147). The specimen labelled *Cardamine virginica* in the Linnean Herbarium has been examined by Dr. N. L. Britton, who identifies it (Bull. Torrey Club, xix. 221) with *Sisymbrium asperum* L. of Southern Europe. The description of the plant in Sp. Pl. 656 runs:—

"Cardamine foliis pinnatis; foliolis lanceolatis basi unidentatis.

"Alyssum foliis radicalibus pinnatis in orbem positis; caulinis lanceolatis, siliculis compressis. Gron. Virg. 170.

"Nasturtium, bursæ pastoris folio, virginianum, flore albo, siliqua compressa. Pluk. Alm. 251 [261], t. 101, f. 4.

"Habitat in Virginia.

"Folia radicalia in orbem digesta, pinnata; foliolis numerosis, fere imbricatis, sublanceolatis, a latere postico denticulo uno brevi juxta basin. Caulis minus foliosus: foliis raris, sæpius linearibus integris. Habitus Bursæ pastoris."

The Gronovian plant (Clayton No. 462) is in the National Herbarium, where it has been identified by Dr. Gray as *Arabis Ludoviciana* Meyer, and Plukenet's figure evidently represents the same species.

C. virginica Michx. Fl. Bor. Am. ii. 29 (1803) appears to be quite different from the plant of Linnæus, and has been named by Dr. Britton (*l. c.*) *C. arenicola*.

The synonymy of the plant is as follows:—

ARABIS VIRGINICA Poiret, Encycl. Suppl. i. 413, excl. syn. *C. virginica* Michx.; Trelease, Branner & Coville Rep. State Geologist Ark. for 1888, p. 165 (1891), etc.
Cardamine virginica L. Sp. Pl. 656 (1753), non Linn. herb.
C. Ludoriciana Hook. Journ. Bot. i. 191 (1834).
Arabis Ludoviciana C. A. Meyer, Ind. Sem. Petr. ix. 60 (1843).
Cardamine parviflora L. subsp. *virginica* O. E. Schulz in Engl. Bot. Jahrb. xxxii. 484 (quoad pl. Linn.).

Clayton No. 528, mentioned by Gronovius in Fl. Virg. 100, and bearing the name *Nasturtium aquatile*, is either *Cardamine parviflora* L. or a close ally.

NOTE ON ERICA BRUNIADES L.

By James Britten, F.L.S.

It is pleasant to announce the completion of the monograph of the genus *Erica*, which Messrs. Guthrie and Bolus have elaborated with much care for the *Flora Capensis*. I hope later on, when I have had an opportunity of arranging in accordance with it the species contained in the National Herbarium, to notice the monograph at some length; at present I propose to give a note only on *Erica bruniades* L., the treatment of which suggests regret that the opportunity has not been taken for clearing up certain points of synonymy and for an examination of types.

After the description, the authors have the following note:—"Plukenet seems to have first given this name (Almag. Bot. Mant. 69, t. 347, fig. 9, 1700), but Bentham refers the plant to *E. villosa*. As there may be some doubt about it, and as Plukenet was pre-Linnean, we have not cited the figure under either species" (Fl. Cap. iv. i. 239).

It is quite true, as I shall show, that there has been "some doubt" about the plant of Plukenet, which, so far as the description goes, was wrongly referred by Linnæus himself; but it is surely to be regretted that Mr. Bolus, always a welcome visitor at the National Herbarium, should not have taken the very slight trouble

necessary to settle what it was. In Herb. Sloane (cii. 280) we have not only Plukenet's specimen from which the figure was taken, but also the original sketch; and there can be no doubt that these are the plant generally accepted as *E. bruniades* L.

In the *Species Plantarum* (ed. 1, 354; ed. 2, 504), however, Linnæus places as a synonym "Eriocephalus bruniades ericæformis monomopatensis, capitulis globulorum instar interius cavis et densa lanugine tectis. Pluk. Mant. 69, t. 347, f. 9." But this phrase belongs, not to *E. bruniades*, but to *E. capitata*, which is figured on the same plate and occurs on the same page in Herb. Sloane. Plukenet's synonym for *E. bruniades* is "Eriocephalus Bruniades africana, Corios tenuissimis foliolis, caule pilosissimis, suffrutex peramænus"; this is correctly quoted by Salisbury (*Linn. Trans.* vi. 333) for his *rellerifiora*, which is by common consent reduced to *bruniades*. Correctly, that is, with the exception of "f. 9," which, although cited by every one, from Linnæus to Messrs. Guthrie and Bolus, has no existence in fact: the figures on the plate are not numbered—there are only seven of them—and the "9" is part of the reference—"fol. 69, pl. [planta] 9"—to the *Mantissa*. The Plukenet phrase "Eriocephalus Bruniades ericæformis," etc., must be transferred to *E. capitata* L.; the Linnean reference to Seba's *Thesaurus* under both species is correct. The Plukenet figure of *E. capitata* (t. 347, fig. [2]) is not very characteristic, but his specimen is unmistakable, and the original drawing shows how the figure came about. Linnæus's citation under *E. bruniades* of "Eriocephalus bruniades ericæformis," etc., was clearly an inadvertence; Dryander, in our copy of Ray's *Historia*, iii. (Dendrologia, p. 97, where Plukenet's "fig. 9" is rightly placed) notes "this is *bruniades* L., Herb. Sherard, in his own handwriting."

This "fig. 9" makes another appearance in Burmann's *Flora Capensis Prodromus*, p. 19, where it is the sole citation for his *Erica abrotanoides*; this stands first on Messrs. Guthrie and Bolus's list of "imperfectly known species," but may evidently be placed under *E. bruniades*. This trivial, by the way, was not applied by Plukenet to one plant only, but to three, which he considered as forming a "novum genus."

I cannot help expressing regret that the example set by Mr. Hiern in his portion of the *Flora Capensis* has not been followed in the present monograph. The Sloane Herbarium is rich in specimens from Oldenburg, Kiggelaar, and Hermann, who, though "pre-Linnean," seem entitled to recognition; and the earlier collectors in the Banksian Herbarium should, I think, have been quoted—*e. g.* Masson, Nelson, Robertson ("False Bay, April, 1772"—very unsatisfactory specimens, which perhaps should be referred to *E. villosa*), and Thunberg (his *E. capitata*, authenticated by himself), and John Roxburgh. But on this head I shall probably have more to say at a later period.

SOWERBY'S DRAWINGS OF FUNGI.

By Worthington G. Smith, F.L.S.

(Concluded from p. 243.)

284. Agaricus (Pholiota) squarrosus Müll. The originals are two very rough uncoloured outlines. On the back of one drawing is written: "plenty at Wansted on old stubbed-up stumps in fascicles of 50 or more."

285. Agaricus (Hypholoma) fascicularis Huds. The original is only an uncoloured pencil sketch, but there is a small coloured group of four individuals on the drawing; these are not on the plate. The example with the slate-coloured pileus at the bottom of the plate is a mere pencil outline on the original, but there is a second sheet on which this figure is coloured; not, however, slate-colour, as on the plate, but olive-brown; the latter is correct, the slate-colour is a mistake. On the second sheet is a large additional partially coloured section; a smaller coloured section, apparently the original of the section on the plate, three groups, one of two, one of nine, and one of about a dozen examples very lightly indicated. On the drawing with the olive-brown pileus is a note, "varying to the color as above the emboid and edge drys first." On the back of this is another coloured section and two pencil groups, one of twelve examples. This group, although named "fascicularis," looks more like *A.* (*Psilocybe*) *spadiceus* Fr.

288. Polyporus cytisinus Berk. The original is only a slight pencil outline.

289. Polyporus hybridus B. & Br. The original is an uncoloured pencil sketch; a second pencil drawing, of the same species, in a less developed state, is on the sheet.

290. Auricularia mesenterica Fr. The original is partially coloured, the colouring very fine, but there are pencil outlinings of much larger plants than those shown on the plate; the latter are shown growing upon a different kind of stump from the specimen engraved.

301. Agaricus (Pleurotus) applicatus Batsch. The two upper figures on the plate, which are practically duplicates, are represented by one example on the drawing. The original is not of such a raw verdigris colour as the plate. There is a detail of the gills on the drawing and a note, "stem and pileus hairy."

304. Agaricus (Psalliota) arvensis Schaeff. This is made up from two drawings; the two small examples at the base are additions. There is another drawing of this species in the Museum.

305. Agaricus (Psalliota) campestris L. This is made up from two drawings, but the two infant stages are on neither drawing. There are three infant examples on one drawing, all different from the plate. On a third drawing two young examples are drawn, and the one on the right is engraved. There is only one section on the plate, but four on the drawings. One represents the variety which

turns rose-colour or crimson on being cut or broken; to this Sowerby has appended the remark,—"changes very red in cutting —fine mushroom tast," and "soft in middle of stipes as a kind of pith liable to slip out in cutting." There are five drawings in all, one represents a fine large specimen, with a section.

311. SCLERODERMA VERRUCOSUM Pers. The original of this is a rough uncoloured pencil sketch.

313. GEASTER COLIFORMIS Pers. The original of this is a very slight uncoloured pencil sketch; the details on the plate do not quite agree with the drawing. There is a water-colour drawing of this species in the Dickson-Sowerby Collection not agreeing with Dickson, iii. f. 4, which is obviously taken from a very different original. The Dickson-Sowerby drawing clearly represents the two plants on Sowerby's plate; the unnatural cloud of spores seen issuing from the smaller example on the plate is only represented by a faint stain on the original drawing; the rays of the outer peridium differ. Of the larger example the interior peridium of the drawing differs in shape from the plate, and many more orifices are shown. The rays of the outer peridium also differ, yet the same example is meant to be represented in both drawing and plate.

322. AGARICUS (OMPHALIA) MURALIS Sow. The upper figure, the middle and lower figures on the plate are only faint outlines on the original; the section is coloured in the drawing, but is not much like the plate. There are twelve other figures, all coloured on the original, large, small, and unengraved. There is a second drawing, made on parchment, of ten examples growing on two tufts of moss. A note says, "var. of eburneus?"

323. AGARICUS (INOCYBE) RIMOSUS Bull. The stems in the original are darker in colour than on the plate, and there is a half-section of a stem and pileus. There is a second drawing, unengraved, of two examples and a complete section.

324. AGARICUS (HYPHOLOMA) APPENDICULATUS Bull. The original sketch of the expanded example is $\frac{1}{2}$ in. more in diameter than the figure on the plate. The group on the left is uncoloured in the original, and there is a pencil group of six specimens. The colours on the drawing are less brassy than on the plate.

326. POLYPORUS VAILLANTII Fr. There is no original of this.

327. HYDNUM MEMBRANACEUM Bull. The original of this is an extremely slight uncoloured sketch with but little resemblance to the plate. On the drawing there is a small additional figure, not on the plate. The details of spines are different in form on the drawing, and the example on the left of the plate is not on the original.

328. ODONTIA BARBA-JOVIS Fr. The original is a slight uncoloured pencil sketch without the grass of the plate.

329. ITHYPHALLUS IMPUDICUS Fisch. There is no original of this.

331. BOVISTA PLUMBEA Pers. The original consists of four examples, of which three are reproduced on the plate. They are not

carefully copied, and the original of the section is $\frac{3}{8}$ in. more in diameter on the drawing than on the plate.

332. LYCOPERDON BOVISTA L. A coloured original exists for the second figure from top of plate, with pencil indications of a larger growth behind. At the part where the reticulate cracks appear on the plate, part of the peridium is shown as peeled up in the drawing.

332. LYCOPERDON PYRIFORME Schaeff. There is an original for the bottom left-hand group of the plate. This appears to be made up from a much larger group in pencil, partially coloured. The habit and the strands of mycelium are characteristic of this species. Two notes are given as to this group: "Tops apparently wash'd with rain," and "substance like cork a little softer."

332. LYCOPERDON EXCIPULIFORME Scop. The three right-hand figures of the plate represent this species. There are two drawings for this, one large and wholly coloured, containing seven examples; the other has three examples coloured, and two or three others faintly pencilled behind. The original of the chief figure is $\frac{3}{4}$ in. taller, and without the formal and unnatural reticulation shown on the plate; the diameter of the peridium is $\frac{1}{8}$ in. more on the drawing. The section appears to be made up from two sections, one on each drawing.

333. CLAVARIA ACUTA Sow. There are two originals for this: one for the three small clubs and enlarged section below; the other drawing shows a single club for the pair of clubs on the plate. On the single small club on the drawing Sowerby has written "shape" to the white, upper part, and "transp^{t}" to the ivory-coloured lower part.

334. PISTILLARIA PUBERULA Berk. This plate is made up from two partially coloured drawings. The plant-stem, on which the plants are shown growing, is more slender and natural on the drawing, and the second stem is narrower and nearly three times as long. Notes say,—"fern stalk" and "should be upright." The enlarged clubs are from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. more in height on the original.

341. AGARICUS (NAUCORIA) HORIZONTALIS Bull. The original is a small uncoloured sketch of the roughest class; the example with the split pileus is not on the original. There is one note, "done."

342. AGARICUS (CLITOPILUS) INORNATUS Sow. The diameter of the pileus in the original is $\frac{1}{4}$ in. more than the plate, and the section $\frac{1}{4}$ in. less. There is one note, "very near turbinatus E F 102. Tast insipid." There is a very good drawing of this much discussed species in the Wheeler collection of drawings in the Museum, dated Sept. 1888, Abbotsford Leigh. Mr. Wheeler has named his drawing *A. clavipes*, from which *A. inornatus* differs very materially.

343. NYCTALIS PARASITICA Fr. The original agrees with the plate; there are no notes.

344. AGARICUS (NAUCORIA) CUCUMIS Pers. This is made up from two original drawings. There is one note, "smell strong fishy rank."

345. POLYPORUS HISPIDUS Fr. This plate is made up from two very much larger coloured drawings. On the back of the smaller drawing is written, "on apple trees essex"—"Sept 1794," and "in Kensington G^{ds} on an ash in a young bud state on the 6 but 14 inches wyde and 8 from the tree strait to the extreem edge, consequently grown many square inches in a fortnight thickness varying much." On the back of the larger drawing is "on an ash in Kensington g^{ds} Sept 20 1795. fine specimens more than 8 inches in semi diameter from the tree the sides and disc in proportion making an half circle about .... inches in the thickest part but in that respect very irregular in portions." There is also a slight pencil sketch. Of the three parts of the plate, the upper does not exist on the originals, the central projects ½ in. more than copy and the height 1½ in. more, the lower portion is 2¼ in. more than original with the height the same. The proportions are therefore very different in the plate and on the originals. There is a drawing in the Museum of a third group of this species 8¼ in. deep and 6½ in. in projection.

346. MERULIUS TREMELLOSUS Schrad. This plant, named on the plate Boletus arboreus, is placed by Fries under *Merulius himantioides*. The plate is wholly unlike the original drawing; there are no notes. In the letterpress description Sowerby says the plant grows on rotten willows and an old oak stump, and that "In rainy weather it is of a jelly-like substance; in dry, horny." The original drawing clearly represents *Merulius tremellosus*, to which plant the plate is referred by Laplante, Dict. Icon. des Champ. p. 492. The same author, however, refers the plate to *M. himantioides* at p. 217. Fries, under the latter species, says, "B. arboreus Sowerb. t. 346 hac forte pertinet." In the British Museum there is a coloured drawing of *M. tremellosus* made for the Rev. M. J. Berkeley, and dated 1837. On this drawing is written, "certainly Bol. arboreus E. F. 346" and "the texture agrees exactly with what I remember of that plant," signed "J. D. C. Sowerby 1837." The original drawing for Pl. 346 is well executed, the flesh-coloured veins of the original are replaced by rusty-brown pores on the plate. In fact the plate only bears a remote resemblance to the original.

349. MERULIUS CORIUM Fr. On the Museum plate—not the drawing—of the last-mentioned species there are two faint pencil outlines, which are apparently the originals of Sowerby's t. 349—Fries mentions this plate under *M. corium*, p. 349. Laplante follows Fries under *M. corium*, but at p. 492 he makes the plate to be *M. tremellosus*.

350. CORTICIUM CŒRULEUM Fr. This plate is made up from a partially coloured original. On the drawing is written, "embrio of auricularia."

361. LENTINUS VULPINUS Fr. The original is an uncoloured pencil drawing.

363. AGARICUS (CLITOCYBE) CYATHIFORMIS Fr. The original is much larger, the pileus being 4½ in. diameter to the 3¼ in. of the

plate, and the stem in proportion. On the plate the right- and left-hand figures are mere reversed views of one plant; they are different in form and proportion from the original. The small left-hand figure is an addition, and not *cyathiformis* at all; it has an umbonate in place of a depressed pileus; the intermediate section is not on the original, and on the drawing there is an upper part of an example unengraved. There is a second and smaller drawing with a duplicate of the larger section and of the right-hand specimen, but both larger than the plate. A third drawing consists of a number of slight outlines; at the back of this is written, "Hemsted."

364. Coprinus plicatilis Fr. There is a coloured group of nine examples of this species and a pencil outline of four others, but none are the originals of the plate.

365. Agaricus (Inocybe) sindonius Fr. The original and plate differ considerably in size. There is one note, "tast a little like cabbage stalk but watry."

366. Agaricus (Clitocybe) vernicosus Fr. The Agaric is $\frac{1}{4}$ in. less across the pileus than the original, and the section is $\frac{3}{16}$ in. less. The plate has but little resemblance to the original drawing.

381. Hygrophorus obrusseus Fr. The original of the chief figure is $\frac{3}{8}$ in. more across the pileus, and $\frac{5}{8}$ in. taller in the stem. There are two other fully coloured figures on the original; the section is not inverted, and there is no red colour. The right-hand yellow example is not on the original. The scarlet figure on the plate is not on the drawing, it represents *H. coccineus* Fr. The bottom right-hand example is not on the original, it is *H. conicus* Fr.

382. Lentinus lepideus Fr. There is no original of this, but there is a drawing of a drooping example and section of this species, unengraved. This drawing is remarkable, as it represents a new plant springing from a dark sclerotium, or perhaps part of an old stem. There is one note, "harder than cork." The plate represents the plant as springing from a buff-coloured sclerotium 3 ins. long, and $\frac{3}{4}$ in. wide at its widest. Other sclerotioid examples are illustrated in the Museum collection of drawings.

383. Nyctalis asterophora Fr. There is an original of this, and the actual examples illustrated are folded in paper on the original drawing. There are two notes bearing reference to the pulverulent pileus; one, "puccinia looking like mucor on the dusty head" and "the identical mealy powder itself, the whole has a strong smell." Sowerby illustrates the "starry conidia," and writes, "The dust of the head &c not as Bull[d] has fig[d] with globules thus" (here a small sketch) "by indistinct vision but as above" (*i. e.* Sowerby's own sketch) "perfect round but adhereing to each other so as to deceive the sight which they are most apt to do when crowded thus" (another sketch) "each taking a particle of the other to its side, making it opaque thus" (a final sketch). Two very small examples on the stem of the original are omitted; there is an additional pencil outline of this or some other Agaric on the original.

384. AGARICUS (COLLYBIA) VELUTIPES Curt. The original of this is a rough pencil sketch with three smaller growths at the base; not a single small growth as on the plate.

390. BATARREA PHALLOIDES Pers. There is a coloured original of this, in which the pileus is $\frac{1}{8}$ in. more across, and the visible part of the stem $3\frac{3}{8}$ ins. longer. The two sections on the plate are not on the original, but the latter shows a second stem—cut off near the base—inside the volva, as if two plants had grown from one volva. I have seen similar double growths in other *Phalloideæ*. A single—not double—veil is shown on the pileus in the original. There is only one note, "model'd."

407. AGARICUS (TOGARIA) PRÆCOX Pers. Sowerby names this plate *A. virosus* Sow., but his description of 407 really belongs to 408, and the description of 408 applies to 407. Sowerby makes both plates however represent one species, which he terms *A. virosus*, and this he makes equivalent with *A. glutinosus* Curt. and *A. semiglobatus* With., but the two plates really represent several different species of *Agaricus*. Plate 407 is represented in the British Museum by the original drawing, of which the plate—as regards colour—is a very bad copy. The original, without doubt, belongs to *A. præcox* Pers. Weight is added to this identification by the two dates and locality, "June 14th" and "Aug. 1796"—"Kensington Gardens." The original coloured drawing gives five examples and a section. In the letterpress description of 407 and 408, Sowerby says that the plants engraved have been mistaken for champignons, which, he goes on to say, had received "the trivial name of *Orcades*"—meaning *oreades*. Later on he says that "Mr Bolton—I belive was the first to give it this title"—but Bolton really does not use the word; Bolton names his t. 151 "Fairy Agaric," and says it grows in fairy-rings. Sowerby repeats the word "Orcades," so it can hardly be a misprint. No reliance can be placed on what Sowerby says about the Mitcham case—"nearly proved fatal to families at Mitcham and Christchurch," as the plants represented on 407–8 belong to different subgenera of *Agaricus*.

408. AGARICUS (STROPHARIA) STERCORARIUS Fr. and AGARICUS (STROPHARIA) SEMIGLOBATUS Batsch. *Agaricus* (*Stropharia*) *semiglobatus*, Nos. 4 and 13 on plate; there is only one example on the original. *Agaricus* (*Stropharia*) *stercorarius*, 11, 12, 14 on plate; numbered 3, 2, 3 on the original. There is a note to this,—"the same with nitens Bull[d]" Fig. 12 on the drawing has the base of the stem obliquely cut off, showing it to be hollow. Fig. 2 on the drawing has the stem complete to the base. Fig. 7: the gills are not shown on the original, and the colours do not exactly agree. There is a note in pencil on the back of the original drawing which obviously refers to *A. semiglobatus*, very well illustrated in fig. 13:—"I am induced to put in such varieties as perhaps may seem quite inconsistent with the common appearance a general character of this Agaric, which may induce the appellation perhaps of monstrous indeed? and which if my concience would let me I could divide into many species in the present species. I dare not innocently indulge the thought as

it were even better to put a wrong species with it than mislead in this dangerous tribe the example of *Ag^s muscarius* of Linn is a sufficient example which having by later Botanists been multiplied into many species they would give a confidence that all but that allowed to stand with the Linn name may be wholesome species and thus be poisoned by confiding in a mistaken nicety. The present agaric has been multiplied into too many species which is the more unfortunate as those looked up to for the best information on the subject will probably feel a confidence in the learned authors who treated on the subject. It was considered as a new species by M^r Curtis because it is sometimes covered with a gluten particularly so on a fine dewy morning which absolutely gave the name A. glutinosus to at (*sic*) the time we gathered it but I had not studied the subject then at all. Fig. 1." 4 and B on plate.—"nitens when the gluten is dryed into a varnish Bull^d fig 2"—12 on plate, "semiorbicularis Bull^d. 422, 13, fig from its form" "globatus Batsch 110 and With^g." "The synonems will show how much they have been confounded and divided." A little over three lines of the notes are pencilled through. There is a second drawing of *A. semiglobatus* with seven single examples, a group of three, also two coloured sections both in duplicate, another drawing of three examples partly coloured, and a pencil sketch of two specimens which may be referred doubtfully to this species.

412. STEREUM PURPUREUM P. The original is a finely executed coloured drawing $\frac{1}{8}$ in. larger than the plate, with a background of moss omitted in the plate. The dark salmon-coloured *gills* on the plate are correctly drawn as a *plain surface*, and coloured pale slate on the original. There are no gills in *Stereum*.

There is a second drawing by T. Purton in the British Museum of what may be this, or a new species. Berkeley has written upon it, "Stereum purpureum P. var." It represents a beautiful snow-white plant, zoned near the white margin with a black line. Sometimes *S. purpureum* may be seen white after being bleached by the sun, but I have never seen it with a narrow, even, black zone near the edge. The drawing is on one leaf of a letter from Purton to Sowerby, which reads:—"Alcester May 31. 1810 Dear Sir I have received the parcel safe and consider myself much obliged to you for your remarks. The annexed figure is a sketch of a Plant which was gathered from a tree in this Neighbourhood and brought to me yesterday. I really believe it will be found, to be a new Auricularia at least I cannot discover any description among the british species which at all corresponds with my specimen. The upper surface is snow-white, woolly, or rather frosted over like a *bride-Cake*—the substance and the black zone with the white edge gives it a very elegant and beautiful appearance, the under side is purplish brown, something like the tremelloides but not of so bright a bloom, the upper surface is tiled* and curled in a very beautiful manner, but I will send you a specimen the first opportunity and any other information which you may require. I will also send you the fern with its appendages as soon as I can. I am Dear Sir very faithfully

* imbricated.

T. Purton." "I dont know the synonyms to Sphæria granulosa Trichia sphærocephala and Peziza granulata and therefore am unable to find any description of them. Withering as a Book of reference is my chief dependance." Behind this letter is a pencil draft of a reply from Sowerby to Purton, as follows:—"Dear Sir I yesterday rec^{d} your kind letter with information of your having rec^{d} the cryptogamic &c safe with the very intelligent drawing and description of Auricularia elegans as I had named it in my case about 2 years since and which I rather wanted to see or learn more of by other specimens before I could confirm it as a species the black edge or border is so very characteristic of it that I could wish to express it, woud A. atro-marginata do better? I shall thank you for specimens to show this corresponding or characters as well as the Fern &c when convenient who am Sir Truly yrs J. S-y." "Peziza granulata is only a name I have given it to recognize it by." "Sphæria granulata Bull^{d} is the only author I know that has it beside myself." "Trichia sphaeriocephala Flora Scotica rather Clathrus of Relhan." There is no sketch in the Museum by Sowerby of any *Stereum* corresponding with Withering's sketch, although Sowerby states that he had named it "about two years since."

413. Cantharellus aurantiacus Fr. There is an original of this with six examples; there are three on the plate. There is one note, "not odorous rather strong scented like Ag. ulmarius."

414. Agaricus (Inocybe) fibrosus Sow. The original is $\frac{3}{4}$ in. more in diameter, and is lighter in colour; it is also furnished with a good section showing the sinuate gills separating from the stem. The pileus of the original is not brassy in colour like the print, but pale dull ochre. There is a slight sketch of a *Mucor* on the original drawing, with notes.

415. Russula fœtens Fr. There is only an original of the section of this; there is one note, "stipes often more swoln." On the back of the drawing is written, "Eau medicinale—Either the Sonchus oleraceus or some other Plant of near Affinity—and certainly a lacesent syngenecious Plant. H. Beeke."

419. Boletus edulis Bull. In the original the pileus is $\frac{7}{8}$ in. more in diameter, and the plant $\frac{1}{2}$ in. more in height. On the drawing is written, "Bol. solidus" and "massive Boletus." On the back of the original is written, "Does not change much if cut fresh but the next day when cut changed red in parts but not the broad part of the stipes which became satiny the day after being cut fresh but cut the next day it was spongy but did not decidedly change reticulation on the stem fine but regular and deep towards the pileus reaching more indistinct to nearly obliterated towards the middle of the stipes, often much larger." There is also a drawing of a second section.

420. Boletus granulatus Linn. The original and plate agree: there is a coloured drawing of a section of a much larger plant. The following notes occur:—"Odour disagreeable, resembling Ag^{s} ulmarius does not change after cutting" and "pileus very glutinous."

421. Boletus rugosus Fr. There is a finely executed original of this, but badly copied on the plate; the original has a pileus $\frac{1}{8}$ in. more in diameter, and the stem at the middle is $\frac{3}{8}$ in. more in diameter. The section on the plate does not belong to this species at all, but is copied from a section of *B. scaber* Fr.—on another drawing. There is a note, "variety of the proper B. edulis the stipes of which is purely white and does not change color when cut." Sowerby names his drawing "Boletus subfuscus. Withering."

422. Polyporus alligatus Fr. The coloured original is $\frac{3}{8}$ in. less in diameter than the plate, but there is a pencil indication of another example which is $\frac{7}{8}$ in. larger. There is one note: "Miss Fanshaw a larger and white spec^{m} with a very light crimson violet shade Sept. 11. 1800."

423. Polyporus amorphus Fr. This is copied from a finely drawn pencil sketch. Sowerby terms his original "Boletus corrugatus irregularis confertus."

424. Dædalea vermicularis Pers. The British Museum possesses the original drawing and three proof impressions of this; one of the latter uncoloured and unnumbered, one coloured and unnumbered, and one coloured and numbered. The two coloured plates show different shades of colour, both very much darker than the original drawing, which is palest salmon. There are two notes, one, "Battersea, in one of the boxes belonging to the red House in contact with the woodwork and the ground Aug. 27th 1804"; the other reads, "pores upwards, partly elongated irregularly curved no truly punctated the rising consequently irregular somewhat rounded and finely tomentose about $\frac{1}{8}$ of an inch deep flesh coloured the rest irregularly solid partly flesh coloured and . . . partly white some part porous and some with neat pores the rest rather radical or rooting."

425. Polysaccum olivaceum Fr. The original of this is a highly finished uncoloured pencil drawing much finer than the plate, in which both the figures are separate, not one overlapping the other as on the plate. The details of the peridiola are clearly shown on the drawing. The two upper figures on the plate, "Peziza crispa," are not on the original. There is an unnumbered and uncoloured proof plate in the Museum with the reference letters in ink.

BIBLIOGRAPHICAL NOTES.

XXXV.—L'Héritier's Botanical Works.

Concerning L'Héritier's life and tragic death the accounts given by Cuvier (Mém. Inst. Nat. Paris, iv., 1802, p. 39) and Sir J. E. Smith (Rees's Cyclopædia, xvii., 1811) probably tell nearly all there is of importance, at least, so far as botanical work is concerned; but some additional items concerning him can be gleaned from his letters to Dryander, which form one of the Banksian MSS. in the Department of Botany, Natural History Museum, and from

the correspondence of Dryander and of Sir Joseph Banks. Of his works, however, much remains to be cleared up with reference to their manner and time of issue. Some facts of importance from forgotten sources have come to light, and it seems desirable to place these on record.

One of the chief peculiarities of L'Héritier's publications is that, although they were prepared at the time indicated, none of them appeared at the date printed on the title-page. L'Héritier's explanation in the case of his *Stirpes Novæ*, when taxed by Cavanilles with deliberately pre-dating his works was (Journ. Paris, No. 51, Mar. 1789) that he had promised subscribers four parts in the year, and that the dates were those of the years in which they should have appeared.*

The preface to the first part of the *Stirpes Novæ* is dated 3 Dec. 1783. The six parts bear date—Fasc. i. & ii., 1784; Fasc. iii.–vi., 1785. Cuvier's statement that seven parts were issued is incorrect; it is founded on a misapprehension of the "Conspectus" of the seventh part, which was simply a prospectus. Several not altogether successful attempts have been made to clear up the actual dates of publication of these parts. Dates are given in the bibliography in the *Hortus Kewensis*, but evidently the earlier parts had only been received after L'Héritier's visit to England, for the record stands—Fasc. i. & ii., 1784; iii., 1785; iv., 1788; v., 1789; and vi., "not yet published" (Hort. Kew. i. 21). Otto Kuntze (Rev. Gen. iii. 157) follows this version in the dates of the first four parts, gives "Jan. 1789" for the fifth, and "1 Semester, 1789" for the sixth, basing his conclusion for the last on the fact that Lamarck, in the *Encyclopédie Méthodique, Botanique*, tom. iii. 1789, quotes, not always correctly, from the sixth part.† This apparently inevitable conclusion, however, is incorrect.

From announcements and notes by De Lamétherie in the *Observations sur la Physique* the following facts may be gleaned:—

Fasc. i. and ii., though printed off, had not been issued in December, 1784 (*op. cit.* xxv. 475). The "Prospectus," and with it, by inference, Fasc. i., appeared in March, 1785 (xxvi. 308). The prospectus alone is here quoted, but, from the allusion made in the next reference, Fasc. i. must have gone out at the same time, or very soon after. This is borne out by L'Héritier's first letter to Dryander, dated 2 April, 1785, in which, though the work is not named, he says:—"Je vous prie d'accepter l'exemplaire ci-joint, à l'égard des Prospectus, j'ai pensé que personne n'étoit plus en état

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* An item of information concerning L'Héritier overlooked by his biographers throws some light upon the causes of his delays: "L'Héritiers botanische Arbeiten gehen sehr langsam; der Verfasser ehmals Conseiller à la Cour des Aides, war seit Jahr und Tag Commandant du Bataillon de St. Nicholas des Champs und izt einer der Richter an den 6 Tribunaux de Paris: dabei leidet die Botanik: er hat zwar ein paar hundert Zeichnungen für die *Stirpes* und das *Sertum Anglicum* fertig, allein die gelehrte Welt, dörfte in verschiedenen Jahren noch nichts davon sehen" (Usteri's *Annalen der Botanick*, i. 170 (1791)).

† That this volume of Lamarck's did appear in 1789 is proved by the citation of it in the preface to Cavanilles' *Decima Dissertatio Botanica*, dated 1 Feb. 1790.

que vous de les faire parvenir aux Savans et Amateurs qui s'occupent de l'histoire naturelle, et que vous voudriez bien me rendre ce service." Fasc. ii. and iii. seem to have been issued together, and are reviewed in May, 1786 (xxviii. 390; xxx. 10).

Then ensued the dramatic flight to England with the Dombey Herbarium (to be referred to later), causing a suspension of publication till after his return, late in 1787. Fasc. iv. was issued about March, 1788, and was followed late in the same year by Fasc. v. (xxxiv. 9, 79), which seems to have been sent out with the first part of the *Sertum Anglicum*; Cavanilles at first (xxxiv. 183, note) gave Jan. 1789 as the date, but afterwards corrected it to late in 1788. Fasc. vi. was not issued till late in 1791 (xl. 9), though it had long been in preparation, and the apparent paradox of Lamarck's quoting it in his work issued in 1789 is easily explained on the ground that L'Héritier had furnished him with preprints—a by no means uncommon custom of that or of a later period, as when the results of several distinct voyages were being simultaneously worked out.

With the sixth part was issued the "Conspectus fasciculi septimi," paged 183–184, giving brief descriptions of plates lxxxv.–xcvi.; part vii., however, was never circulated, and the unpublished numbered plates that have been preserved do not correspond exactly with this text. Citations in Aiton's *Hortus Kewensis* (iii. 11, 12, 50) are taken from this Conspectus.

The summary of the incomplete work therefore stands as follows:—

Fasc.	Pages.	Plates.	Date on Title.	Date of Issue.
i.	i.–vi., 1–20	i.–x., & vii*.	1784	March, 1785
ii.	vii. & viii., 21–40 ..	xi.–xx.	,,	April, 1786
iii.	ix. & x., 41–62 ..	xxi.–xxx., & xxx*.	1785	,, ,,
iv.	xi. & xii., 63–102 ..	xxxi.–xlviii.	,,	March, 1788
v.	xiii. & xiv., 103–134	xlix.–lxiv., & lii*., liii*., lvi*., lvii*. & lix*.	,,	Dec.? 1788
vi.	xv. & xvi., 135–181.	lxv.–lxxxiv.	,,	Dec.? 1791
vii.	"Conspectus" only, pp. 183–184 ..	—	—	1791

Shortly after his return to Paris, L'Héritier began to issue what he called "monographies," consisting of a plate or two, with a sheet of descriptive text, uniform with that of the *Stirpes*, in which (see his letter to Dryander, 18 Aug. 1788) it was his intention subsequently to incorporate them. By 29 July, 1788, he had published in this form, without title-page or date, *Louichia* (afterwards in *Stirpes*, pl. lxv.), *Virgilia* (2 pls.), two editions, *Michauxia* (2 pls.), two editions — the last four plates are included among the unpublished plates of the *Stirpes*, and numbered cxvi.–cxix., while *Buchozia* was shortly to follow.

Subsequently another (*Hymenopappus*) was circulated; and there is an unissued proof copy in the De Candolle library of a memoir on "*Kakile*, cum animadversionibus in *Buniadem*, *Myagrum*, *et Crambem*," pp. 11, fol., 1788. Pritzel further records plates without text of *Oxybaphus* and *Tricratus* (the latter is among the unpublished plates, and numbered cxx.).

According to Cuvier, only five copies of each monograph were struck off; these were so distributed by the author, whom he describes as a bibliomaniac, that no one should have a perfect set; Sir J. E. Smith, however, "always understood that twelve of each were printed."

From letters to Dryander, we learn that two other monographs had been prepared. Writing on July 7, 1788, L'Héritier gives a summary, with brief diagnoses and references to fifteen plates, of a "petit travail" to be entitled *Solana aliquot variora*, which he proposed to publish at the end of that year; the diagnoses of the new species, with references to the plates, are transcribed in Ait. Hort. Kew. i. 246–252—one at least, *S. Vespertilio*, is based on a plant in the Banksian Herbarium. Following letters show that Dryander was sending proofs of the *Hortus Kewensis* to L'Héritier, who writes concerning them. On March 12, 1789, he writes to Dryander concerning a monograph of *Juglans*, to contain six plates.

Some sets of plates, ready engraved, numbered, and some of them coloured, in continuation of the *Stirpes*, were distributed to correspondents. Pritzel cites twenty-eight in the De Candolle library (presumably either sent to Aug. De Candolle, or acquired by him with L'Héritier's library), and saw pls. 85–124 in Moretti's. There is a similar set in the Kew library, of which some are coloured. The Department of Botany possesses the set from Banks's library, and proofs before letters of some of them, besides unlettered proofs of plates numbered in pencil from 125 to 167. The proof plates bear notes in the handwriting of L'Héritier, Solander, and Dryander.

From references in his correspondence with Dryander, some of which are printed in the *Hortus Kewensis*, it is seen that a second volume of the *Stirpes Novæ* had been mapped out. By piecing together the scattered references it has been possible to draw up a nearly complete list of the contents of this projected volume, which is here appended:—

Plate.		Letter to Dryander.	Cited in Hort. Kew.
3	Linum Africanum	—	i. 388
4	Œnothera grandiflora	18 Aug. 1788	ii. 2
5	,, fruticosa	,, ,,	,, 4
6	,, rosea	,, ,,	,, 3
7	Daphne odora	,, ,,	,, 26
8	,, sericea	,, ,,	
9	Kalmia glauca	,, ,,	,, 64
10	Ledum serpillifolium	,, ,,	,, 65
11	Andromeda polifolia	,, ,,	,, 68
12	,, paniculata	,, ,,	,, 69
[*s. n.*]	,, arborea	,, ,,	
13	,, racemosa	,, ,,	
14	,, axillaris	,, ,,	
15	,, lucida	,, ,,	,, 70 as A. coriacea
16	,, acuminata	,, ,,	,, 70
17	Styrax octandra	,, ,,	,, 75
18	Lychnis grandiflora	,, ,,	,, 117
19	Pallasia halimifolia	2 Feb. 1789	iii. 498
20, 21	Virgilia helioides	,, ,,	
23	Rubus fruticosus (var.)	8 Sept. 1788	

Plate.		Letter to Dryander.		Cited in Hort. Kew.
24	Rubus multiflorus	8 Sept.	1788	
25	,, Pensylvanicus	,,	,,	
26	Clematis Calycina	,,	,,	ii. 259
27	Stachys Æthiopica	11 Sept.	,,	,, 302
28 29	Dracocephalum peregrinum	,,	,,	,, 317
30	Scrophularia trifoliata	,,	,,	
31	,, mellifera	,,	,,	,, 343
32	,, scariosa	,,	,,	
33	Selago ovata	,,	,,	,, 355
34	Buchnera	,,	,,	,, 357 (B. viscosa)
35	Malva angustifolia	17 May,	1789	
38	Ebenus pinnata	29 Dec.	1788	iii. 504
39	Glycine capitata	,,	,,	
40	Clitoria	,,	,,	
41	Colutea cruenta	,,	,,	,, 55
42	,, procumbens	,,	,,	
43	Hedysarum vespertilionis	,, [but without No.]	,,	,, 504
44	Galega grandiflora	,,	,,	,, 70
45	Psoralea angustifolia	,,	,,	,, 79
47	Dichrocephala erecta	2 Feb.	1789	
49	Hypericum repens	29 Jan.	1789	
50	Scorzonera canescens	,,	,,	
,,	Urena radiata	17 May,	,,	
51	Prenanthes alba .. .. .. (Changed to 55, 17/v/89)	29 Jan.	,,	
,,	Urena præmorsa [Hibiscus præmorsus L.]	17 May,	,,	ii. 454
52	Leontodon	29 Jan.	,,	
,,	Urena hirta [Hibiscus urens L.] ..	17 May,	,,	
53	Scolymus Barbarii	29 Jan.	,,	
54	Hibiscus panduræformis	17 May,	,,	
55	Bidens decussata	8 Feb.	,,	
56	Cacalia sarracenica	,,	,,	
57	Eupatorium fœniculoides	,,	,,	
58	Comptonia asplenifolia	,,	,,	iii. 334
,,	,, styraciflua	3 Mar.	,,	
59	Collignonia	8 Feb.	,,	
60	Lactuca spinosa	,,	,,	
61	Santolina simplicifolia	,,	,,	
62	Gnaphalium	,,	,,	
63	Baccharis Dioscoridis	,,	,,	
64	,, alata	,,	,,	
65	Senecio discolor	,,	,,	
66	Aster macrophyllus	,,	,,	,, 208
67	Inula	,,	,,	
68	Millerioides	,,	,,	
72 73	Tagetes [2 n. sp.]	12 Feb.	1789	
74	Chrysanthemum araneosum ..	,,	,,	
75	,, grandiflorum ..	,,	,,	
76	Cotula aurea	,,	,,	
77	Achillea pectinata	,,	,,	
78	Verbesina repens	,,	,,	
81 82 83	Coreopsis	,,	,,	
84	Centaurea tagetifolia	16 Feb.	,,	
85	,, Breynii	,,	,,	
86	,, Balsamita	,,	,,	

Plate.		Letter to Dryander.	Cited in Hort. Kew.
87	Centaurea semialata	16 Feb. 1789	iii. 259
88	,, hyalina	,, ,,	
89	,, ferox	,, ,,	
90	Tanacetum canariense	12 Feb. ,,	
91	Xanthium fruticosum	8 Mar. ,,	,, 344
92	Quercus pseudosuber	,, ,,	
93	Sterculia platanifolia	,, ,,	,, 378
94	Bryonia latifolia	,, ,,	
95	Podiscocarpus neriifolia	,, ,,	
96	Acer striatum	,, ,,	
97	,, pensylvanicum	,, ,,	
98	,, opalus	,, ,,	,, 436
100	Rhapis flabelliformis	12 Mar. ,,	,, 473

Of these the following are represented in the pencil-numbered series, *viz.*:—6 = 134; 17 = 135; 28 = 142; and 31 = 147.

All the references to this unpublished volume were withdrawn from the second edition of the *Hortus Kewensis*.

When in England, L'Héritier had already projected and was working at a monograph on Geraniums, and for that purpose examined the Banksian Herbarium, on which he based some of his species, to which names are attached in his own handwriting. The forty-four plates for the work were published under the title *Geraniologia*, with a title-page bearing the dates 1787–1788, which (see p. 267) were those during which the subscribers should have received the parts, and not necessarily those of publication. Usteri (Ann. der Bot. S. iii. 1792, p. 217) says: "Von diesem schon so lange angekündigten, und auf dem Titelblatt mit den Jahrzahlen 1787. und 1788. verschenen Werke, werden izt, in der Mitte des Jahres 1792, nur allein die Kupfer ausgegeben, mit der Nachricht der Text solle bald nachfolgen." It may not unfairly be assumed that it was sent to Zürich with the Fasc. vi. of the *Stirpes*, and, like that, may have been in circulation in Paris somewhat earlier, though it was evidently not out when L'Héritier replied to Cavanilles in March, 1789. Lamarck does not mention it when citing the *Stirpes*, nor does De Lamétherie in any of his annual summaries in the *Observations sur la Physique* allude to it, though L'Héritier's other works are mentioned. Its probable date of issue was late in 1791 or early in 1792.

Concerning the text, L'Héritier writes to Dryander on 12 April, 1789: "Enfin je reprends ces chers Geranium pour ne les plus quitter"; he establishes *Erodium* as a genus, and gives a list of the species. Lists of the species of *Pelargonium*, *Geranium*, and *Monsonia*, with brief diagnoses, follow in letters dated 19 and 26 April and 3 May, 1789. It was from these lists that the citations in the *Hortus Kewensis* were made. The text was never printed, and the unpublished MS. passed into the De Candolle library; but Dryander (Cat. iii. 301) records as having seen in Sir Joseph Banks's library a "prima plagula Geraniologiæ brevioris, in qua continentur differentiæ specificæ, synonyma et loci natales 26 specierum Erodii cum observationibus quibusdam," in octavo. This fragment is recorded in the bibliography to the second edition of the *Hortus Kewensis*, but cannot now be traced in

the British Museum Library. The plates were reissued in 1813 by a naturalist named Garnery.

The *Sertum Anglicum*, "seu plantæ rariores quæ in hortis juxta Londinum, imprimis in Horto Regio Kewensi excoluntur, ab anno 1786 ad annum 1787 observatæ," was prepared during L'Héritier's stay in England, and his dedication, dated Paris, April 20, 1788, is a graceful acknowledgement of the kindness he received while in this country. The beautiful plates were drawn by James Sowerby and P. J. Redouté, the latter of whom was in England about this time;* they were, however, engraved in Paris. The numerous descriptions in the text are largely based on specimens in the Banksian Herbarium, though this is not mentioned; it seems important to point this out, for, as Mr. Spencer Moore has shown in this Journal (1901, 386), L'Héritier's species have been in some cases entirely misunderstood, owing to his types not having been consulted.

The title-page is dated 1788, and the first fascicle, containing 36 pp. of text (all that was published) and two plates, was issued in that year; the text consists of 32 pp. of "Synopsis Operis"—brief diagnoses of the species figured and others—and detailed descriptions of two pages each of the two plates, from which it is evident that the remaining plates were to have been similarly accompanied. The remaining fascicles were, however, issued without text: fasc. 2 (tt. iii.–xii.) are, we learn from Usteri, in 1790; fasc. 3 (xiii.–xxiv.) and 4 (xxv.–xxxiv.) in 1792.

At about the same period appeared a monograph of *Cornus*; this is dated 1788 on the title-page, a date accepted by Roemer and Usteri in their review of the book (Mag. Bot., St. 6, 1789, p. 87); but De Lamétherie (Obs. Phys. tom. xxxvi. 1790, p. 24) includes it in his summary for 1789, and rightly, for in a letter to Dryander, dated 29 Dec. 1788, L'Héritier states, "Je n'attends pour faire mettre sous presse mes *Cornus* que pour votre reponse."

As presently shown, L'Héritier did not think very highly of either dissertations or academic memoirs; nevertheless in 1790 as De Lamétherie chronicles, Obs. Phys. 1791, p. 6: "M. L'Héritier a présenté à l'Académie des Sciences de Paris, 1° un Mémoire sur le genre *Hemitomus* voisin du *Celsia*, L.; ce nouveau genre renferme quatre espèces nouvelles originaires du Pérou, & rapportées par M. Dombey; 2°. un Mémoire sur le *Taxus elongata*, L. dont l'auteur fait un genre nouveau qu'il a appelé *Podocarpus*." These communications do not appear to have been printed.

Two papers by him were read before the Linnean Society, of which he was a Foreign Member, and published in vol. i. of its Transactions (1791): "On the Genus of *Symplocos*, comprehending *Hopea*, *Alstonia*, and *Ciponima*," and "On the genus of *Calligonum*, comprehending *Pterococcus* and *Pallasia*. A "Mémoire sur un nouveau genre de plante appelé *Cadia*" was printed in the *Magasin Encyclopédique*, v. 1795, with a plate; and a "Mémoire sur les effets du froid de Ventose an iv. (Février et Mars 1796) sur divers

* See "L'Héritier's Species of Relhania," Journ. Bot. 1884, 123; the genus and the sixteen species assigned to it (*Sert. Angl.* 22) are founded on material in the Banksian Herbarium.

végétaux, et particulièrement sur le Poirier" in the *Mémoires de l'Institut National des Sciences*, tom. i. 1798.

It may be of interest to place on record here L'Héritier's explanation, given in a letter to Dryander dated 1 Sept. 1788, of the principles that guided him in nomenclature:—"Vous me faites un guerre impitoyable pour les changemens de noms. Il est peut-être un peu trop vague de s'en tenir toujours au premier nom imprimé. On courroit risque d'en adopter de trop mauvais, et cela coute lorsqu'on sent la possibilité d'en donner un bon. Je ne changerai point les noms donnés dans des ouvrages d'une certaine conséquence, en un mot dans ceux qui marquent et comptent en Botanique. Mais pour ceux qui ne se trouvent insérés que dans des dissertations, ou mémoires académiques, je pense qu'on peut sans conséquences les changer, non pour le plaisir de changer, mais si l'on trouve occasion d'en substituer un meilleur. . . . (Here he gives examples) . . . Pour les noms triviaux, voicy mon opinion. Dans les genres nouveaux, qui ne contiennent qu'une espèce, le meilleur trivial me paroit être celui qui rapproche le genre du genre le plus voisin. Cela présente aussitôt une idée utile. . . . Voilà les motifs qui m'ont fait adopter *oides* . . . quoique cette terminaison soit dure et barbare et qu'elle ne me plaise pas plus qu'à vous."

The correspondence of Banks and Dryander contains many letters relating to the bringing of Dombey's herbarium to this country by L'Héritier, of which an account is given in the interesting and sympathetic life of Dombey contributed by Smith (who was personally acquainted with him) to Rees's *Cyclopædia*, and in the translation from Deleuze in König & Sims's *Annals of Botany*, ii. 495. The story is too long for transcription; suffice it to say that Dombey, who had promised the Spanish Government that he would not publish any of the results of his travels, except under certain conditions, was induced to part with his herbarium to Buffon, who in his turn confided it to L'Héritier, with orders to publish its contents. "This," says Smith, "was no sooner known at Madrid, than interest was made by that court to defeat the measure, and the court of Versailles was not in a condition to dispute, even so unjust, and politically unimportant a requisition, from that quarter. Buffon had orders to withdraw the herbarium, but L'heritier on the first alarm had taken it over to London, and the writer of this narrative, with his lamented friend, Broussonet, and his draughtsman Redouté, were alone entrusted with the secret. Happy and safe in a land of liberty and science, L'heritier remained about 15 months devoted to the prosecution of his object, chiefly under the hospitable roof of his friend, Sir Joseph Banks."

(To be concluded.)

SHORT NOTES.

Centunculus minimus L. in Wilts. — This has never been recorded, though it is locally abundant in the south-east of the county. I have found it at (5) Hamptworth Common; W. Grinstead; Hound Wood, Winterslow; (6) Clarendon Woods. The first- and last-mentioned stations are nine miles apart.—Edward J. Tatum.

Cotoneaster microphylla (p. 244).—Miss Macdonald informs us that the specimen of this plant which she sent to the Museum was not found at Cornelly, but on the high road between Cowbridge and Cardiff, about four or five miles from the former and eight from the latter place, on an open bank on stony soil.—Ed. Journ. Bot.

Liparis Loeselii Rich. in Glamorganshire.—This record adds much interest to an already interesting flora. The recent discovery in this county of *Weingaertneria canescens*, which, if native, links us with the Channel Islands on the one side, and with the eastern counties on the other; of *Hieracium cambricum*, known else only from a few isolated spots in North Wales; of *H. cantianum*, a Kent and Surrey plant (now also recorded from the Wyndcliff); of *Rubi* so limited in range as *R. thyrsiger*, *R. sulcatus*, *R. rotundifolius*; of *Vida stagnina*; the well-known isolation of *Draba aizoides*; and now the occurrence of *Liparis Loeselii*, all point to the importance of Glamorganshire in any discussion of the problem of plant distribution in the British Isles. This last discovery raises the question whether there have not been in times past localities for *Liparis* stretching across the country from the eastern counties? The possibility of its occurrence in the midlands now becomes almost a probability. The Rev. E. F. Linton kindly confirmed my naming of the plant, which I had never before seen in any condition. The locality in which it occurs was quite dry at the time of the discovery: in winter it is no doubt wet, but never impassably wet; it could not have been that even in the worst days of 1903. There is a good quantity, many hundreds of plants in fact, healthy, and in excellent fruit, covering perhaps an acre of ground. The nature of the locality is to some extent indicated by the association with *Liparis* of such plants as *Epipactis palustris*, *Orchis latifolia*, and some *O. incarnata*, *Scutellaria galericulata*, *Hydrocotyle*, *Anagallis tenella*. Botanists will require no apology for reserve in indication of the locality. There is no danger of the plant being disturbed or exterminated by natural means. The previously known distribution of *Liparis* in Great Britain included only five counties, Norfolk and Suffolk, Cambridge and Hunts, and Kent. It may have been found also in Lincolnshire. The occurrence here is a remarkable extension of range. — H. J. Riddelsdell.

Walney Island Plants.—In July, accompanied by Mr. Reginald Farrer, I visited Walney Island in order to see *Geranium lancastriense* in its classic locality. Although the place is now practically a part of the playground of Barrow-in-Furness, the Geranium still occurs, although not very abundantly. It is associated with other forms which show a range of colour from pure white to dark crimson; but to me the texture of the petals, even those like the normal inland *sanguineum* in colour, was somewhat different, and there was slight variation in outline from the type: but whether this is constant I am unable to say. The white as well as the pink-flowered plant retains the character in cultivation. On the same

island I was delighted to see *Pneumaria maritima*, which does not appear to be recorded for that division of Lancashire in *Topographical Botany*, although Walney Isle was doubtless the habitat—"one of the iles about Lankashire"—where it was found by Mr. Thomas Hesket, as recorded in Parkinson's *Theatrum*, p. 767 (1640). It is duly included in Baker's *Flora of the Lake District*. Here, too, occurred *Crambe maritima*, *Glaucium luteum*, *Thalictrum dunense*, **Viola Pesneaui*, *Galium verum* var. *litorale*, **Euphorbia portlandica*, *Festuca rubra* L., *Agropyron junceum* Beauv., and *its hybrid with *A. repens*. On the island I also saw *Sisymbrium Sophia*, *Rubus Selmeri*, and *R. corylifolius*. The asterisk denotes new county records.—G. Claridge Druce.

NOTICES OF BOOKS.

Index Kewensis Plantarum Phanerogamarum Supplementum Secundum . . . . Leucocoryne—Zygostates et Emendanda Addenda. Oxford: Clarendon Press. 12s. net.

This concluding part of the Second Supplement to the *Index Kewensis* appears with commendable promptitude. What, we wonder, has happened to the First Supplement, which came to a stand with *Physaria* in 1903? We trust it will not be long delayed, as the gap for species published 1886–95 is awkward for those who consult the work.

The portion before us, judging from the few cases tested, seems more carefully done than the former, and the corrections we indicated (Journ. Bot. 1905, 65–67) have for the most part been included in the "Addenda"; probably *Crocodilodes Zeyheri* and *Impatiens taprobanica* are excluded for some reason not easy to guess—they were certainly as duly published as the rest. We are sorry that the hope we expressed (p. 100) with regard to the reductions of certain names has not been verified; the retention of one of them—*Psilotrichum rubellum* Baker—seems inexplicable, as the reduction to *Centema biflora* Schinz (based on the same Welwitsch number) has been made, not only in Bull. Boiss. vi. 563—the place indicated in our former note—but also in the Welwitsch Catalogue. The treatment of the genus *Linnæa* presents a difficulty not easy of solution; Dr. Graebner, in his monograph in Engler's *Jahrbucher*, xxix, includes *Abelia* under this name as a subgenus, and all his new species are published as *Linnæa*. The Supplement places in italics all that were first published as *Abelia*, but prints the new species in roman, which will mislead those who take the *Index* for a final authority instead of a work of reference. *L. adenotricha*, by the way, although an equivalent of *A. adenotricha* as stated, should be referred to *Lonicera Elisæ* Franch. (see Journ. Bot. 1904, 320). Perhaps we attach undue importance to the citation of this Journal, but had it been more carefully examined, the Supplement would have gained—e. g. *Pentas verticillata*, retained by the Supplement, was shown (Journ. Bot. 1897, 127) to be an equivalent of *P. longiflora*, and *Marsea viscosa* (Journ. Bot. 1898, 53) is omitted. A more

noteworthy omission is that of *Polygonum Deasyi*—the name substituted in Journ. Bot. 1900, 495, for the preoccupied trivial *tibeticum* (which is cited in the Supplement) under which the plant was first described (p. 428): the name *Deasyi* is also indicated as new in the index to our volume.

We have more than once pointed out that the persistent misdating of the *Kew Bulletin* must inevitably lead to error, but one might have hoped that this would have been guarded against in a Kew publication issued under the same editorship. But the number of the *Bulletin* bearing date "December, 1895" was not issued until 1896, and the new species published therein should therefore have been included in the Second Supplement. We learn, by the way, that the letter in the *Times* to which we referred on p. 191, has resulted in enquiries in the House of Commons. The President of the Board of Agriculture stated that, "owing to the increasing demands upon the scientific staff at Kew in recent years, it has not been found possible, since 1899, to issue any further numbers of the *Bulletin*"; and, moreover, that he was "doubtful whether the issue of further numbers would justify the additional expenditure which would be entailed." Reminded that the Director, in his evidence before the Committee on Botanical Work, had spoken of the *Bulletin* as a "continuous record of Kew work in all its aspects," and that some numbers of the volume for 1901 had been issued, Mr. Ailwyn Fellowes undertook to consider its completion, and agreed to make further investigation into the matter. We trust that some steps will be taken to secure the resumption of the Annual Reports of the Gardens and Herbarium, for which the *Bulletin* was at best an ineffective substitute.

Organography of Plants, especially of the Archegoniatæ and Spermophyta. By Dr. K. Goebel. Authorized English Edition by Isaac Bayley Balfour, M.A., M.D., F.R.S. Part II. (Special Organography). Royal 8vo, pp. xxiv, 708. With 417 woodcuts. Price 21s. net, in cloth; 24s. net, in half morocco. Oxford: Clarendon Press.

When the first part of this important work appeared, five years ago, we noticed it at some length (Journ. Bot. 1900, 403), and indicated the general scope of the whole book. The second part, nearly three times the size of its predecessor, has now been published, with an admirably complete index, occupying more than fifty pages, to the entire work. It has had the advantage of being read in proof by the author, who has modified the text in several instances and added new notes; so that it is no mere translation of the German original and, indeed, sometimes—*e. g.* on the germination of microspores—represents Prof. Goebel's later views. In his introduction the author briefly discusses the question of "the relationship between formation of organs and adaptation"—"Are the *specific* marks which separate from one another the several species, genera, and so forth, within one series, of a purely adaptive nature as the extreme disciples of the 'natural selection'

school hold, or are the specific and the adaptive marks separable?" In his opinion, the reasons for which he proceeds to show, "there can be no doubt that the latter is the case."

The book is divided into two main sections, Bryophyta and Pterodophyta with Spermophyta; the first contains Hepaticæ and Mosses, and is treated at considerable length—a proceeding which, says the author, "receives its justification in the fact that these plants offer an easily accessible and easily cultivated material for experimental organography, and that they, especially the Hepaticæ, show particularly clearly how by different paths complex configuration has been reached from simple beginnings." In dealing with the Pteridophyta much use is made of Prof. Douglas Campbell's researches as embodied in his *Structure and Development of Mosses and Ferns* *—"the most complete account of the group."

It would be impossible, in the space at our disposal, to give anything like an adequate notice of this important work, of which the mere table of contents extends to twenty pages. The original has already taken its position as an indispensable summary of the observations of other botanists, and as a monument of the author's own researches; and in its English form it cannot fail to become the text-book of the advanced student. The work is the more valuable in that the author has himself travelled widely and observed carefully the plants in their native habitats; some of his individual observations are very interesting; thus, speaking of *Drosera macrantha*, which he found in West Australia, he notes that the description in systematic works of the stem as twining is incorrect: "the leaves have very long stalks and cling to shrubs by their outer tentacles, which are bent back specially as traps for insects, and the leaf-surfaces lie with their under side upon the upper surface of the twig, a striking secretion of the recurved tentacles gluing them firmly to it" (p. 419).

It only remains to be said that the work is as well turned out as one expects Clarendon Press books to be; the type and paper are excellent; the illustrations numerous and clear; the binding is strong, and the book opens easily and will lie open flat upon the table—a small detail which adds greatly to the facility and pleasure of using it.

Mendelism. By R. C. Punnett. Pp. 63, 12mo. Cambridge: Macmillan & Bowes. 1905. Price 2s.

It is doubtful whether the modesty of the Abbot of Brünn would have allowed him to view with favour the form of advertisement which dubs specialized ideas or tendencies with the meretricious tag of an *-ism*. The much abused suffix may be either distinctively appreciative, or contemptuous, or damnatory, among examples respectively such as Darwinism, Balfourism, and Hooliganism. The progress of a cult to the dignity of an *-ism* is neither uniform nor permanent. So much has been written latterly on the biological significance of the trend of investigation, forelimned in Mendel's

* See Journ. Bot. 1896, 89.

researches and experiments, that it is difficult to crystallize out a concise statement of their salient features in a little book like this. Mendel's own account is so clear, and so free from theoretical padding and discursiveness, that the student who is really interested in the subject cannot do better than go to the original, or to Mr. Bateman's scholarly translation of Mendel's papers. To those who will not take this trouble, Mr. Punnett's brochure is a sort of explanatory index and running commentary, without any claim to originality either in form or in criticism.

Whether the ordinary reader will readily understand the respective merits of the selected gametes, and the ultimate vagaries of the resultant zygote, is another thing. Apparently the central problem in the characters fixed by heredity may be worked out in the farmyard, and fame is in store for the man who will solve the riddle of the blue Andalusian fowl.

As with many theories at their inception, their application is afterwards found to be wider and more far-reaching in scope than ever their authors dreamed of. The side-issues, foreshadowed in the *Origin of Species*, have themselves been developed by specialists out of all proportion to the importance of the dominant principles in Darwin's thesis. Mr. Punnett's final remarks are in accord with the utilitarian basis of ethics which, in an age of evolution, is the only sound one—that a frank acceptance of the principles of heredity naturally impairs even if it does not nullify the doctrine of free-will, that education does but little to modify the innate character of the individual, who is, whether he will or no, the zygote-automaton compounded and blended of the multiform gametes of his ancestors, physically, mentally, and morally. "As our knowledge of heredity clears and the mists of superstition are dispelled, there grows upon us with an ever-increasing and relentless force the conviction that the creature is *not made but born*." The differences among the children of the same parents are due to modifications of dominant or recessive characters, prevalent at different periods of their joint lives, to such small extent as they influence the common heritable characters of both.

FREDERIC N. WILLIAMS.

The British Moss-Flora. By Dr. R. BRAITHWAITE. Part xxiii. May, 1905. Pp. 201–274, title-pages, tt. cxxi–cxxviii. Price 9s. London: published by the author, 26, Endymion Road, Brixton Hill.

IT is twenty-five years since Dr. Braithwaite began the publication of his great work on the British mosses, and with the present part he brings it to a close. With steady perseverance, and despite all the claims made upon his time by the exacting duties of his profession, he has elaborated the details of his scheme, and completed, on his eighty-first birthday, a monograph which earns for him the gratitude of moss-students. Long may he live to enjoy the esteem which is his due! In such features as illustrations, synonymy, cited literature, and distribution of the species, the *British Moss-*

Flora easily heads its class. In classification and nomenclature the author has chiefly followed S. O. Lindberg, thereby introducing among us novelties and changes to which we can but slowly accustom ourselves, the nomenclature being of the advanced type adopted by the New York school. In the present part the *Neckeraceæ* are brought to an end, the genera treated being *Neckera*, *Alsia*, *Climacium*, *Fontinalis*, *Antitrichia*, *Leucodon*, *Cryphæa*, *Hedwigia*. Then follows a supplement containing twenty-four species which have been added to our flora since the earlier part of the work was printed. The general index provides what we have long waited for—a ready clue to the classification and synouymy of the book. From the use of heavy type in the index for the adopted specific names it is easily computed that 622 species are recognized in the work. In a postscript the author announces that he has handed over the treatment of the *Sphagna* to Mr. Horrell, who introduced (Journ. Bot., April to December, 1900) Warnstorf's system of Sphagnology to British readers.

A. G.

BOOK-NOTES, NEWS, &c.

The Trustees of the British Museum recently presented to the Sydney Herbarium about 600 specimens of the plants collected in Australia by Banks & Solander, and these were exhibited at a recent meeting of the Linnean Society of New South Wales. Commenting on the exhibit, we learn from the "abstract of proceedings" that "Mr. Fletcher pointed out that the Banksian plants suggested a matter of something more than sentimental interest to Australian naturalists which needed ventilation, namely, the whereabouts of Dr. Solander's Journal, and the prospects of its publication as a companion volume to Admiral Wharton's *Captain Cook's Journal* (1893), and Sir Joseph Hooker's *Journal of Sir Joseph Banks* (1896). If the supposition that Banks left the record of zoological and anatomical details to Solander be not altogether groundless, one can understand Sir Joseph's brief mention of certain matters, such as the characteristics of the kangaroo, concerning which his Journal might otherwise have been expected to be more explicit. The expectation that the publication of Solander's Journal would supply a valuable complementary volume to Hooker's 'Banks,' appeared to be not altogether a vain one; and upon this point some interesting evidence was adduced." So far as we are aware, Solander kept no journal; we shall be glad to learn what "evidence" of its existence was "adduced."

The English publishers of Mr. C. S. Sargent's *Manual of Trees*, which was noticed in our May number, are Messrs. Archibald Constable & Co., 16 James Street, Haymarket, W.

We regret to announce that Mr. George Murray has resigned the Keepership of the Department of Botany, British Museum, owing to failing health and consequent inability to discharge the duties of the post.

The death is announced, at the age of forty, of Mr. Henry Lamb, author of the small *Flora of Maidstone* noticed in this Journal for 1889, p. 382. He added *Barbarea intermedia* to the flora of Kent (Fl. Kent, p. lxxvi).

The death has recently been announced, at the age of eighty-six, of Charles Moore, who from 1847 until 1896 was Director of the Sydney Botanic Garden. His collections from the northern districts of New South Wales are utilized in the *Flora Australiensis*; in 1868 he investigated and published some account of the botany of Lord Howe Island, three hundred miles off the coast of Sydney: he also collected in New Caledonia. Besides a few papers, Moore published in 1893 a useful *Handbook of the Flora of New South Wales*; he also contemplated a flora of Lord Howe and Norfolk Islands, which, however, was not published; he had previously (1884) compiled *A Census of the Plants of New South Wales* from Von Mueller's more comprehensive *Census of Australian Plants*. Walter Hill, at one time superintendent of the Botanic Garden at Brisbane, died early in this year: his collections for the vicinity of Moreton Bay are embodied in the *Flora Australiensis*.

Dr. Theodore Cooke's *Flora of the Presidency of Bombay* continues to make steady progress. The part issued in July contains the orders *Boraginaceæ* to *Verbenaceæ*, and manifests the careful work which has characterized previous portions. Of another Indian flora which is appearing in parts—Mr. Duthie's *Flora of the Upper Gangetic Plain*—a second instalment, from *Caprifoliaceæ* to *Campanulaceæ*, has appeared, completing the first volume. Although in get-up inferior to Dr. Cooke's book, it may prove more convenient for use in the field, owing to its smaller size and thinner paper; the placing at the head of each page the name of the genus treated therein is also a convenience. The former is published by Messrs. Taylor & Francis, the latter at the Office of Government Printing, Calcutta.

The second part of Herr C. Christensen's *Index Filicum* (Copenhagen: Hagerup, July 1st, 1905, pp. 65–128, price 3s. 6d.) begins with *Aspidium appendiculatum* and ends with *Asplenium refractum*. Between these names nearly three thousand alphabetically arranged names, synonyms, and cross-references intervene; each of these is accompanied by a citation of literature. These points are sufficient to indicate what an important and comprehensive aid the *Index Filicum*, when completed, will be to fern-students.

"The Sundew: a flesh-eating plant which catches midges, ants, beetles, butterflies, and dragon-flies" is the startling heading of an article in the *Morning Leader* of Aug. 18. It is fair, however, to say that the article itself is mainly accurate, and contains no reference to dragon-flies as part of the sundew's prey. The *Daily News* (Aug. 19), which rivals the *Daily Mail* in its scientific researches, says that "the housewife has for centuries been turning to a good purpose one of the most fearful of microbes—the saccharomigees cerevisiæ—which causes bread to rise and is commonly called yeast."

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BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

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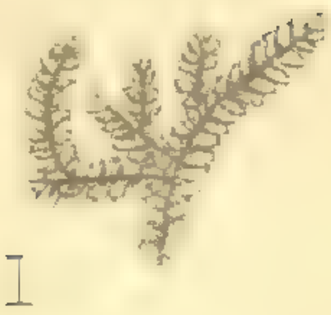

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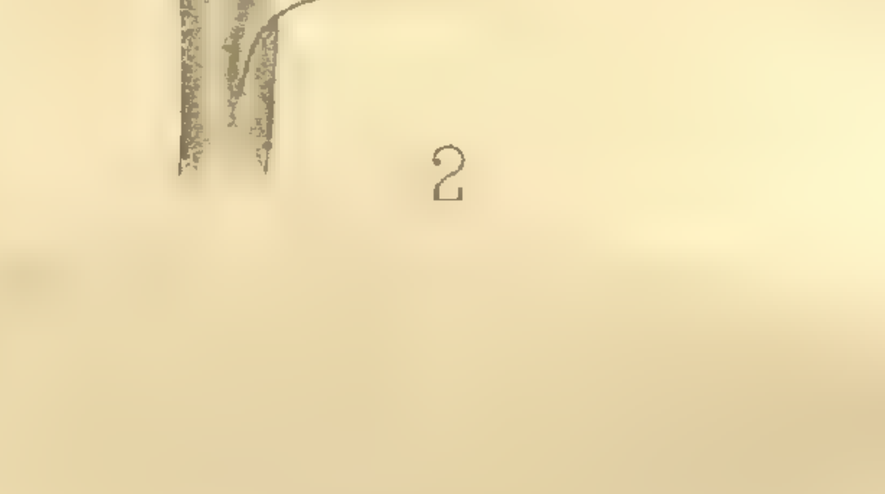

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Plagiochila killarniensis *Pearson*.

A NEW HEPATIC FROM IRELAND.

By W. H. Pearson.

(Plate 473.)

Plagiochila killarniensis Pearson. Sterile, small, somewhat rigid, olive green to brown, cæspitose. Stems intricately ramose; shoots small-leaved, radiculose; rootlets frequent, white, long. Leaves, insertion horizontal to patent-divergent, angle 90°–70°, slightly imbricating, alternate or almost opposite, semi-ovate (basal side straight) or oblong-ovate, apex truncate, bidentate; segments divaricate, two, three, and four cells long, usually a double row with two single cells; antical (lower) margin entire, plane or slightly recurved, almost straight, abruptly and very decurrent; postical (upper) margin not crossing the stem, slightly ampliate or parallel with the stem, with one, two, or three small distant teeth; texture somewhat firm, cuticle smooth; cells smallish, roundish; walls thick, angles thickened; marginal cells often firmer and subquadrate.

Dimensions. Stems ½ to ¾ inch long, ·2 mm. in diameter; leaves 1·4 mm. long × ·5 mm. broad; 1·25 mm. × ·7 mm.; cells ·025 mm., ·03 mm.

Hab. Growing on an exposed moss-covered stone, Torc Cascade, Killarney, *W. H. Pearson*, June, 1905.

Obs. The species of the genus *Plagiochila*, although so abundant in tropical countries, are very few in Europe, and are all, with one exception, found in Ireland, so that my journey of about four hundred miles in order to spend three days on ground as classic to the cryptogamic botanist as Killarney has amply been rewarded by the addition of this distinct plant. The first day I was there I visited Cromaglown, but being warned off the mountain at the Hunting Tower I had to botanize by the roadside, the third day being spent in the Horses Glen, near Mangerton, but the stormy, wet weather prevented me doing much collecting. The second day I spent by the Torc Waterfall, and, thanks to hints given me by my friend Mr. Holt, I was fortunate in collecting most of the rarities, including *Radula Holtii* and *Lejeunea Holtii*.

Plagiochila killarniensis is easily distinguished from any of the other native species by the horizontally inserted truncate, bidentate leaves, and although the forms of *P. punctata* and *P. spinulosa* are very numerous, yet, whatever connection this new species may have to extra-European ones, it is remarkably distinct from anything I have ever seen in the British Isles.

I regret that I was only able to find very little of the plant, but probably future collectors may be more fortunate; the place where I collected it was on the exposed surface of a moss-covered stone about two to three feet high and broad, about a dozen yards from the fall, and about three to four yards from the bed of the stream, on the right-hand side facing the fall; growing with it were *Radula*

Carringtoni, *Lejeunea diversiloba* in quantity, and *Lejeunea Holtii* sparingly.

DESCRIPTION OF PLATE 473.

Fig. 1. Plant, natural size. 2. Portion of stem, antical view, × 24. 3. Portion of stem, postical view, × 24. 4. Leaf, antical view, × 24. 5, 6. Leaves, postical view, × 24. 7. Portion of leaf, × 290.

A NEW SILENE FROM THE ANDES.

By Frederic N. Williams, F.L.S.

Silene glaucina, sp. n. (subg. EUSILENE, sect. BOTRYOSILENE, ser. 4 CAPITELLATÆ). Fruticulosa, procumbens, valde glaucina, minute breviterque arcte velutino-puberula, 32–35 cm. Radix crassa dura lignosa saxorum fissuris fixa. Caules plures firmi indurato-herbacei nodulosi remote foliati, simplices vel a caudice ramosi. Folia 9 mm., lineari-lanceolata pauca, basi attenuato-petiolata, apice acuminata subcuspidata, uninervia, nervo per indumentum fere occultato. Bracteæ (vel prophylla) angustiores magis incanæ, ceterum foliis consimiles. Flores in racemo compacto simplici capituliformi conferti: capitulum 8–10 florum, 22 mm. × 12 mm. Calyx 7 mm., breviter denseque velutino-pilosulus, nervis virentibus, dentibus obovato-triangularibus obtusis rubescentibus anguste membranaceo-marginatis. Petala alba; lamina semi-exserta, ungue dimidio brevior, ecoronata breviter ovalis emarginata. Ovarium ovatum velutinum.

In general facies and salient characters most like *S. Aristidis* Pomel, which occurs in similar rocky crevices in the mountainous region of Algeria; it does not resemble any South American species. Capitate flowers are very unusual in the genus.

Hab. Chile; Virgen Hill, in the Andes, at 840 metres, in crevices of the rocks (*G. F. Scott Elliot*, 19 Jan. 1904, n. 444, in Herb. Mus. Brit.).

NOTE ON THE HISTORY OF CLIFTONIA.

By James Britten, F.L.S.

In this Journal for 1903 (p. 87) it was pointed out that the genus *Cliftonia* did not, as stated by Mr. Sargent, following Nuttall, commemorate Dr. Francis Clifton, an English physician, but was named, as recorded in the Solander MSS., "in honorem Dni. Guil. Clifton, armigero, Justitiarus Floridæ occidentalis (Chief Justice of West Florida) qui hanc inter alia specimina ad Dnum J. Ellis armig. e Florida misit." One or two points connected with the history of this interesting plant, although not of much importance, may be worth a note.

Mr. Sargent says "it was probably introduced into English

gardens by John Fraser at the time of one of his last voyages to America, and flowered in 1812 or 1813 in his nursery at Sloane Square in London." Fraser, however, had it in cultivation some years earlier; and it was probably brought home by him after his fourth journey in 1790, or perhaps earlier, as Lamarck describes it (as *Ptelea monophylla*) from specimens sent him from Carolina by Fraser (Illustr. i. 336, "1791" (1792 ?)). It appears in the list of plants grown in Fraser's nursery (reprinted in this Journal for 1899, pp. 485–7), which I think was issued after his return from his fourth journey in 1790, and there is a specimen in Herb. Banks labelled "Hort. Kew. 1798." In this list it stands as "*Walteriana*, nova genera, a very beautiful evergreen shrub;" in Fraser's list issued in 1796 as "*Walteriana*, a beautiful evergreen Shrub, a new Genus, called after Mr. Walter, not in the possession of any other person but J. Fraser." In the list issued in 1813 by Fraser's sons, who succeeded him in the business, it appears among the "plants at reduced prices" as "Walteriana Caroliniensis"— a name misquoted by Mr. Sargent as "Waltheria caroliniensis." This 1813 list was drawn up by Nuttall, and contrasts favourably with its illiterate predecessors; in Walter's herbarium, which was formerly in Fraser's possession, the plant is named "Walteriana Fraseri," the latter word added in Nuttall's hand. Under the name *Walteriana* the plant seems to have been widely distributed. Sims (Bot. Mag. t. 1625, 1814), having referred to Fraser's "inadmissible expedient of giving an adjective termination to the name," adds: "As many collectors may have the plant under the appellation given to it in Fraser's Catalogue, the quotation of it as a synonym may have its use; and we embrace with pleasure the only opportunity afforded us of complying, in some degree, with the wish of the discoverer, in making it the means of recording his grateful attachment to his botanical friend." The name *Walteriana* was published without description. *Cliftonia* was published by Joseph Gaertner (*De Fructibus*, iii. 246, 1805) as of Banks, "ex collectione Banksiana;" the Solander MSS. and Banksian herbarium show that it should rather have been attributed to Solander (as is rightly done by Nuttall, *Sylva*, ii. 92), in whose hand the name and description are written. There are six specimens on one Banksian sheet: "1. Florida occidentalis prope Pensacolam, W. Clifton" (after whom the genus was named); "2. Florida orientalis, J. Bartram"; "3. Carolina, Fraser"; "4. Georgia, W. Bartram"; "5. America septentr. M. Marshall;" "6. Hort. Kew. 1798."

The adoption of the oldest specific name, which was—I think unfortunately—decided upon at the recent Congress, necessitates the adoption of combination *C. monophylla* Britton—an absurdity in a monotypic genus, but natural enough when proposed by Lamarck in the compound-leaved genus in which he placed the plant, the flowers of which were unknown to him.

William Bartram, as Nuttall points out, described *Cliftonia* (as "a new shrub of great beauty and singularity") in his *Travels*, p. 31 (1793). In the volume of his drawings in the Department of Botany there is a description and a figure (p. 71) of the plant

which he localizes "in Gale bays [*i.e.* where *Myrica* grows] and wet spongy branches" in South Carolina. As indicated in Herb. Banks, a figure, to which no name is attached, is given in Abbot's *Lepidopterous Insects of Georgia* (ii. 135, t. 68, 1797), with a note: "The plant in this plate we have been unable to determine. It seems of the Laurel kind, but can be referred to no described species, and yet may perhaps be some well-known shrub that escapes our recollection, as well as that of the most able botanists who have seen the drawing." It will be remembered (see Journ. Bot. 1898, 297) that Smith was mainly responsible for the botany of Abbot's book, but in 1797 *Cliftonia* had not been described, and the flowering branch (without fruit) represented on the plate is insufficient to indicate the distinctive characters of the plant.

THE COLLECTIONS OF BANKS AND SOLANDER.

[The volume of plates and descriptions of the Australian plants collected by Banks and Solander during Cook's First Voyage has been completed by the publication of the third part. To this Mr. Britten has prefixed an introduction, which is here reproduced, giving an account of the plates and MSS. connected with the voyage.]

The publication of the results of Cook's First Voyage was anticipated by the scientific world with the greatest interest, and was expected shortly after the return of Banks and Solander. Linnæus wrote to Ellis, October 22nd, 1771, when Banks was preparing for his proposed second expedition, expressing his regret at the projected voyage as being certain to hinder the publication of the results of the preceding one. He says: "This report has affected me so much, as almost to deprive me of sleep. How vain are the hopes of man! Whilst the whole botanical world, like myself, has been looking for the most transcendent benefits to our science, from the unrivalled exertions of your countrymen, all their matchless and truly astonishing collection, such as has never been seen before, nor may ever be seen again, is to be put aside untouched, to be thrust into some corner, to become, perhaps, the prey of insects and of destruction. I have every day been figuring to myself the occupations of my pupil Solander, now putting his collection in order, having first arranged and numbered his plants, in parcels, according to the places where they were gathered, and then written upon each specimen its native country, and appropriate number. I then fancied him throwing the whole into classes; putting aside, and naming, such as were already known; ranging others under known genera, with specific differences; and distinguishing by new names and definitions such as formed new genera, with their species. Thus, thought I, the world will be delighted and benefited by all these discoveries; and the foundations of true science will be strengthened, so as to endure through all generations! I am under great apprehension, that if this collection should remain untouched till Solander's return, it might share the same lot as Forskall's

Arabian specimens at Copenhagen. Thus shall I be only more and more confirmed in my opinion, that the Fates are ever adverse to the greatest undertakings of mankind. . . . By all that is great and good, I intreat you, who know so well the value of science, to do all that in you lies for the publication of these new acquisitions, that the learned world may not be deprived of them. They will afford a fresh proof that the English nation promotes science more than the French, or all other people together. . . . Again the plants of Solander and Banks recur to my imagination. When I turn over Feuillée's figures I meet with more extraordinary things among them than anywhere else. I cannot but presume, therefore, as Peru and Chili are so rich, that in the South-sea islands, as great an abundance of rarities have remained in concealment, from the beginning of the world, to reward the labours of our illustrious voyagers. I see these things now but afar off. If our travellers should take another trip, I shall have seen them as Moses saw Canaan."*

Troil, writing under date 22nd January, 1773, says: "Their voyage to the South Seas will probably make its appearance in April or May next. They have already begun to engrave the collection of animals and plants they have made on their voyage, which will employ them several years, as they must consist, I should apprehend, of near 2,000 plates."† The younger Linnæus named his genus *Banksia* "in memoriam Josephi Banks, futuri Auctoris splendidissimi operis: Plantarum omnium detectorum Terrarum maris Australis descriptiones et figuræ,"‡ and the four species described by him§ were only "known to Linnæus from specimens and engravings communicated by Sir Joseph Banks."‖ There are other references by Smith in the same work, *e. g.* under *Corræa rubra* and *Melaleuca suaveolens*; as well as in his *Exotic Botany* (ii. 25), where he speaks of "these fine plates intended for future publication, some of which, presented by Sir Joseph to Linnæus, are now before me." Mr. B. D. Jackson informs me that these plates are not to be found at the Linnean Society, and it is not possible to trace what has become of them.

The death of Solander in May, 1782, no doubt partly explains the non-publication of the work on which so much time and money had been spent. According to Smith,¶ the descriptive part of the work had been allotted to Solander; Banks seems to have occupied himself more with superintending the engraving of the plates. Writing to the younger Linnæus in 1778, he says: "Uninterruptedly, however, as I have applied to the work of engraving for near five years, I have not yet advanced above half of my intended progress. About 550 plates are engraved, and I think, if circumstances as yet unexpected do not oblige me to cut it short, it will

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* Smith, Correspondence of Linnæus, i. 267.
† Letters on Iceland, p. 34 (1780).
‡ Supplementum Plantarum, p. 16 (1781).
§ op. cit. 126–7.
‖ Smith in Rees Cyclop. Suppl.
¶ Correspondence of Linnæus, ii. 2.

extend to double that number; understand by this how impossible it will be for you to quote it in a work intended for publication in the course of this year": * later, in an undated letter to Hasted, the historian of Kent, written early in 1782, he says he hopes soon to publish the work, for which he had then "near 700 plates prepared."† Smith, commenting on the former passage, says that this "lasting monument of botanical fame" was "sacrificed to the duties incumbent, for almost half a century, on the active and truly efficient President of the Royal Society."‡ Solander's failure to complete his portion of the work is attributed by Smith to "the interruption caused by other avocations, the dissipation of London society, to which so agreeable a companion was always acceptable, and the indolence induced by a sedentary and luxurious life."§ The very numerous MSS. left by Solander, and the fact that the descriptions, with the exception of the Australian plants, had been transcribed by him for the press, seem to qualify Smith's implied censure, and suggest that the position and numerous occupations of Banks were mainly responsible for the delay which resulted in the non-production of the work.

It may be well to give some description of the various MSS. connected with the voyage, as the published accounts are incomplete or inaccurate. The earliest is a catalogue, for the most part in Banks's hand, of the plants collected, "in the order in which they were loosely placed in the drying books in which they were brought home"; in the earliest part of this the number of specimens of each plant is indicated. This list has been annotated by Solander (who wrote the portion relating to New Holland) and Dryander, and is of great service in correlating the names temporarily bestowed upon the plants (which are often transcribed on the sheets in the Banksian Herbarium) with those under which they were subsequently published.

During the voyage, the more interesting of the plants were roughly described by Solander, whose MSS. are now bound in six small quarto volumes—"Plantæ Terræ del Fuego" (Jan. 1769), with which is bound "Plantæ Insulæ Sanctæ Helenæ" (May, 1771); "Plantæ Otaheitenses et aliarum ins. Oceani Pacifici" (April to July, 1769); "Plantæ Australiæ (N. Zeelandia)" (Oct. 1769, to March, 1770); "Plantæ Novæ Hollandiæ" (April to August, 1770), in two volumes; "Plantæ Javanenses" (Oct. 1770 to Jan. 1771). A transcript of the Tierra del Fuego descriptions, systematically arranged and prepared for press, is bound in a folio volume with similarly prepared enumerations of the plants collected in Madeira (Sept. 1768) and Brazil, "circa Rio de Janeiro" (Nov., Dec. 1768), of which no rough MSS. remain; a second folio volume contains the prepared transcript of the Pacific Islands collection, and a third (paged continuously with the preceding) the "Primitiæ Floræ Novæ

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* op. cit. ii. 575.
† Banksian Correspondence (MS.), ii. 99.
‡ Correspondence of Linnæus, 579.
§ op. cit. ii. 2.

Zeelandiæ." A similar enumeration of the Javan plants was begun, but extended only to twenty-eight pages.

The Australian plants, which formed the most important portion of the collection, were never arranged for press in the manner of the foregoing, but a transcript of the rough MS. was made, apparently by some one imperfectly acquainted with botanical terminology or unable to read the draft, as it contains numerous errors; this is bound in two small quarto volumes, and is the basis of the present publication, for which it has been collated with the original draft. It has been thought advisable to print the descriptions in full as a specimen of Solander's work and as giving details omitted from published accounts of the plants; occasionally a word has been supplied or an unpublished synonym suppressed, but these alterations are indicated by the use of square brackets. The MS. includes a large number of descriptions besides those of the plants figured, but only the portion relating to these is now printed. It was evidently, however, not finally prepared for publication, as the arrangement is not systematic, and only the plants considered as new are included.

The biography of Sydney Parkinson, the draughtsman to whom the figures of the plants and animals observed on the voyage are due, is sufficiently recorded in the preface to his *Journal of a Voyage in the South Seas*, published after his death and edited by his brother Stanfield; but a few words may be said with special reference to his connection with Banks. His brother tells us that he "was put to the business of a woollen-draper; but, taking a particular delight in drawing flowers, fruits, and other objects of natural history, he became so great a proficient in that style of painting, as to attract the notice of the most celebrated botanists and connoisseurs in that study. In consequence of this, he was, some time after his arrival in London, recommended to Joseph Banks, Esq., whose very numerous collection of elegant and highly-finished drawings of that kind, executed by Sydney Parkinson, is a sufficient testimony both of his talents and application." This collection included 40 drawings of animals made from figures and specimens brought from India by John Gideon Loten, Governor of Ceylon, and 12 drawings of plants (1767–8) which, like those of the animals, are on vellum. Two, of Indian plants, are probably from the drawings brought back by Loten; others are noted as from "Mr. Lee, Hammersmith," and "Kew." According to the *Dictionary of National Biography*, it was by the advice of James Lee (not "an artist" but the well-known nurseryman of Hammersmith) that Parkinson was engaged by Banks to accompany the voyage to the South Seas. He died during the return voyage on January 26th, 1771.

The total number of drawings made by Parkinson during the voyage was 955, of which 675 were sketches and 280 finished drawings. All the Australian and most of the New Zealand ones are sketches; those from Brazil, Madeira, Tierra del Fuego, and the Friendly Islands are nearly all finished drawings; of the Java plants there are 44 finished drawings and 72 sketches: in a few cases there are both sketch and finished drawing of the same plant. On the back of each finished drawing are pencil notes by Parkinson,

indicating the colour of the leaves, flowers, etc., and the locality is added in Banks's hand. The finished drawings (other than Parkinson's), from which the engravings were prepared, were made by well-known artists of the period—John Cleveley, John Frederick Miller and his brother James, Frederick Polydore Nodder, and Thomas Burgis (only three)—during the years 1773–1781. J. F. Miller went with Banks in the capacity of draughtsman on his voyage to Iceland in 1772, and was engaged in the same capacity for Cook's second voyage when it was supposed that Banks would accompany it. The artists occasionally supplemented the sketches by reference to the specimens, and sometimes made slight alterations which the specimens do not justify; in the main, however, their interpretation is accurate: the dissections were also added in some cases.

The drawings and specimens seem to have been available for reference very shortly after the return of the travellers. Thomas Martyn, writing to Pulteney in February, 1772, speaks of having recently "spent a morning with Mr. Banks and Dr. Solander, to turn out 3,000 specimens of plants, 1,000 of them new species, and coloured drawings of 700, all elegantly and accurately done upon the spot."* They were also consulted by contemporary botanists in connection with their work; thus the drawings of *Zieria* and *Eriostemon* bear these names in the handwriting of Smith, who established these genera. A reviewer in Konig and Sims's *Annals of Botany* (ii. 366) speaks of the "vast collection of natural productions, and especially of dried plants, with complete descriptions and excellent delineations, both made on the spot, [which] opened as it were a new world to the naturalist, and to the botanist in particular; for these treasures, so ardently expected, although not as yet committed to the press, have by no means been lost to the public, having, by their liberal possessor, been rendered easily accessible to every one desirous of informing himself in the natural history of New Holland."† Gaertner, who published many of the Australian novelties in his important work *De Fructibus et Seminibus Plantarum* (1788–1805), continually acknowledges the help he received from the Banksian Herbarium and from Solander's MSS.: M. Deleuze, in his biography of Gaertner, says: "M. Banks communiqua à M. Gaertner tous les fruits qu'il possédoit sans exception; il lui permit non seulement de les voir, mais de les couper de les analyser pour en dessiner l'anatomie; il lui donna tous ceux qu'il avoit doubles."

In more recent times the drawings were consulted by Sir Joseph Hooker when preparing his *Flora Antarctica*. He speaks in high terms of the value of the collections of Banks and Solander in New Zealand and Tierra del Fuego, and adds: "Valuable as the dried plants are, their utility is doubly increased by the excellent descriptions, and by the beautiful coloured drawings executed on the spot which accompany them and were made at Sir Joseph Banks's own expense."‡ Seemann throughout his *Flora Vitiensis* (1865–73) refers

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* Gorham, Memoirs of John and Thomas Martyn, 141 (1830).
† Ann. Mus. d'Hist. Nat. i. 217 (1802).
‡ Botany of the Antarctic Voyage: Flora Antarctica, ii. 222 (1847).

to the drawings and specimens of the plants from the Friendly Islands, and Lowe cites the Madeira collections throughout his *Flora of Madeira* (1857–72). The Trustees of the British Museum gave permission to the New Zealand Government to obtain a set of engravings of the New Zealand plants from the copper plates; these it was proposed to reproduce in a reduced form in connection with Kirk's *Student's Flora of New Zealand*. The carrying out of this project was arrested by the death of the author in 1897, but it is still the intention of the New Zealand Government to complete the literary portion of the work and to issue the plates in a separate volume. A list of the Madeira drawings will be found in the *Journal of Botany*, 1904, p. 3.

It is a matter for regret that Bentham did not consult the drawings when preparing his valuable *Flora Australiensis*. His work at the National Herbarium was, however, mainly in connection with the collections made by Robert Brown, then the property of Mr. J. J. Bennett, but housed in the Department of Botany by permission of the Trustees, to whom they were subsequently bequeathed; and, as the following pages will show, the plants of Banks and Solander were to a considerable extent passed over unnoticed.

The Australasian collections are represented by 412 sketches; from these 362 finished drawings were prepared, of which 340 were engraved.* From the copper plates of these, the plates illustrating this volume have been lithographed; they represent 328 of the engravings, most of the remainder being unfinished or imperfect representations. Three of the drawings of which no plates exist—*Tribulus Solandri*, *Pleiogynium Solandri*, and *Myrmecodia Beccarii*—being of special interest, were drawn on stone by the late Robert Morgan, and raise the number of plants represented to 331.

Of the New Zealand plants there are 173 sketches, 205 finished drawings, and 185 plates; of those of the Friendly Islands, 14 sketches, 114 finished drawings, and 88 plates; of those of Tierra del Fuego, 1 sketch, 79 finished drawings, and 66 plates; of those of Brazil, 1 sketch, 37 finished drawings, and 23 plates; of those of Java, 72 sketches, 44 finished drawings, and 29 plates; of those of Madeira, 2 sketches, 22 finished drawings, and 11 plates; making a total of 675 sketches, 863 finished drawings, and 742 copper plates, of which 722 are represented in the collection of engravings.

The engravings made from the drawings, so far as they were known, were highly esteemed. Thus Pritzel, who by a curious blunder attributes them to Franz Bauer, refers to twenty-eight of the engravings which form a folio volume in the Berlin Library† as "tabulæ æri insculptæ absque inscriptione inter omnes summi artificis facile pulcherrimæ." Most of the proofs bear no engraver's name; some, however, are signed "D. McKenzie," who probably did most of the work, and others "G. Sibelius." The former, although he does not appear in any dictionary of artists, was

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* Sir Joseph Hooker, doubtless writing from imperfect memory, speaks of the Australian plates as "mainly outlines" (Journal of Sir J. Banks, xxvi.).

† "Liber emtus est Londini ex bibliotheca Fieldiana."

eminent in his day: he engraved twenty-seven of the thirty plates of *Erica* by Franz Bauer which formed the *Delineation of the Exotic Plants cultivated in the Royal Gardens at Kew* (1793-1802) and the botanical plates in Symes' *Embassy to Ava* (1800), and was employed by the Linnean Society; he died in or about 1800. A few of the plates bear the names of Goldar, Robert Blyth, G. Smith, and White as engravers.

It will be observed that the names of species which have been adopted by various authors from Solander's MSS. are throughout the present work attributed to Banks and Solander, although in many instances Solander alone was originally quoted for them. A careful study of the various memoranda and MSS. preserved in the Department of Botany makes it clear that Banks, who had come to be regarded as a patron of science rather than as a man of scientific attainments, had much more botanical knowledge than was at one time supposed. This seems to have been recognized by his contemporaries; thus Smith speaks of what are generally called the Solander MSS. as the work of Banks and Solander,* and Patrick Russell says that the catalogue of plants in the second edition of the *Natural History of Aleppo*† was drawn up by Banks and Solander, although it has been customary to attribute the new species therein described to Solander only.

JAMES BRITTEN.

LIGHTFOOT'S VISIT TO WALES IN 1773.

BY THE REV. H. J. RIDDELSDELL.

THE account of Lightfoot's journey through Wales, here reproduced from Solander's transcript in the Department of Botany, British Museum (Natural History), will best be prefaced by four of his letters to Banks; these serve to establish the year and the company in which he went through Wales. By an error rare in that work, the accurate Dryander, in his Catalogue of Banks's library, gives the year of the journey as 1775, instead of 1773; he also omits to say that the "Journal" is not the original, but a transcript by Solander—a remark which also applies to the account of Samuel Brewer's journey through Wales in 1726–7, which stands next to it in the Catalogue. A few comments in [ ] are inserted in the letters, which are preserved in the MS. copy of Banks's Correspondence (vol. i. pp. 57, 60, 64, 76) preserved in the Department of Botany.

Banks and Lightfoot seem to have made most of their observations together: where either is alone responsible for a recorded occurrence the MS. of the journey seems to draw a distinction. Yet, if it were not for the evidence of the letters, the curiously detached way in which Banks's name occurs as authority for an odd plant here and there might lead to the conclusion that they did not invariably

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* Rees Cyclop. v. *Jasminum*.
† Pref. p. viii.

make their finds in company. But there can be no doubt that the two friends are jointly responsible for the records, regarded as a whole. Both of them collected specimens as they went along: Banks's are at the British Museum, and include plants not mentioned in the Journal. They also include plants communicated to him by Lightfoot after the return to London.

[Lightfoot's herbarium appears to have been dispersed. The following account of it is given by Lady Smith in the memoir prefixed to Smith's *Correspondence* (i. 289):—

"It happened some time in the year 1791, that Sir James's friend, Dr. Goodenough bishop of Carlisle, being about to write a botanical paper on the British species of *Carex*, had occasion to consult the herbarium of Mr. Lightfoot. This had been bought by His Majesty George III.* on the death of its original possessor, and presented to the Queen. Dr. Goodenough obtained permission to examine it: the Queen, being present when he went to Frogmore, conversed with Dr. G. on the subject of his studies. He found the herbarium very much damaged, and recommended Her Majesty to have it looked over by some intelligent person, mentioning Mr. Dryander and Sir James Smith, as either of them capable of advising some method of preserving what remained." Queen Charlotte selected Smith, who made much use of the herbarium in his *Flora Britannica* and in his other works (see his *Exotic Flora*, ii. 20, 1806).† When or how the herbarium left Frogmore we do not know; but Sir William Hooker (Journ. Bot. vii. 341, 1855) tells us it was then in the possession of Mr. Brown; the specimens of *Athyrium fontanum* gathered by Lightfoot on Amersham Church and referred to by Sir William are now in the British Herbarium of the Department of Botany, as are those from Alnwick mentioned in the same paper. Brown's herbarium contained many specimens from Lightfoot's, some of them named by Smith—doubtless when he examined it as above mentioned—but hardly to the extent which would justify the conclusion that Lightfoot's whole collection was included in it. Mr. Boulger (Journ. Bot. 1883, 164) says that Lightfoot's herbarium was included in that of G. S. Gibson, and in the *Biographical Index* it is said to be at Kew: but there seems no sufficient foundation for either of these statements.

Is anything known of the history of Queen Charlotte's herbarium? It contained other plants than Lightfoot's, for we have in the National Herbarium a specimen of *Hydrangea radiata* Walt., labelled by Robert Brown "Carolina, Fraser, from Queen's Herb."

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* For a hundred guineas, fide Druce, *Fl. Oxfordshire*, 357.

† In the interesting and critical "introductory remarks on the composition of a Flora Britannica," prefixed to his "Observations on the British Species of *Bromus*" (Trans. Linn. Soc. iv. 276), and on that account but little known, Smith criticizes the *Flora Scotica* somewhat severely: "If there be so much uncertainty in compiled synonyms and descriptions, even when we are informed from whence they are derived, what shall we say to Mr. Lightfoot's plan of copying from all quarters without any acknowledgment at all? His book is made up of passages from Linnæus, Haller, Scopoli, Dillenius and Gmelin; and he is not by any means attentive to the agreement of those passages with the native plants to which he applies them."

Queen Charlotte was a patron of Fraser (see *Comp. Bot. Mag.* ii. 303).—Ed. Journ. Bot.]

I am indebted to Mr. Britten for bringing these documents to my notice, and for help in preparing the copy for press. I have also to thank Mr. Shoolbred and others for local information, which I could not without them have commanded.

The letters, so far as they relate to the journey, are as follows:—

I.

I have enclos'd you specimens of what I take to be the *Chærophyllum sylvestre & temulum*, & also of the *Melittis*, which I gathered myself near Netly Abby, & what I apprehend to be the *Gnaphalium arenarium* sent me from the Island of Jersey for the *luteo-album*. Had it been in my Power to have recollected anything else that could be acceptable I should have transmitted it with Pleasure.

Unfortunately, the Duchess of Portland [Lightfoot was her Chaplain] is gone to Oxford, & I shall not see her till next Week; so that I am not yet able to determine whether it will be in my Power to have that singular Pleasure (which I ardently wish for) of climbing with *you* the Rocks of Snowden & Caderidris.

If you should set out for Wales before I can determine to join you at Chester or elsewhere, be so good as to desire Mr. Ramsden to advertise me a Week before Hand of his Intention to set out from London, & of the day he moves, that I may resolve him whether I can accompany him. It will be proper likewise for one of us to know where to write to you in Wales, to acquaint you of our Motions and Place of the hop'd for Rendezvous.

If I should be so unfortunate as not to have it in my Power to accompany you, I will take the Liberty to rely on you for a specimen of the *Bulbocodium serotinum* [*Lloydia alpina* Salisb.] which I have no doubt of your finding. I beg my Love to Dr. Solander.

Uxbridge, June 19th, 1773.

II.

Uxbridge, August 24th, 1773.

My Gratitude will be for ever indebted to you for the numberless Pleasures you have treated me with, & the many Advantages I receiv'd in your Company during our Welch Tour: and yet you still continue to encrease the Debt by your Politeness in saying I was useful to you. If I was in any Degree, it gives me a very sensible pleasure, as I can truly say I never became a Party in any Scheme which afforded me more Satisfaction or sincere Delight. It was a Journey above all others I wish'd to take: & I had every circumstance accompanying it that could render it most agreeable. We certainly were most remarkably successful, tho' we did not find *every individual* Plant we wish'd; for I believe it may without vanity be said, that few, if any, Botanical Excursions in Great Britain have exceeded our Collection, either in Number or Rarity of Plants or Places.

I did not turn over my Plants while in London to see whether I had any Specimens which you had not; but since I receiv'd your obliging Letter I have turn'd them all over, & sent you such, as I had any recollection of every kind you had not. I have sent you every Bit of *Athanasia* [*Diotis* from Anglesey] that I gathered, except the roots which went to Kew and Bullstrode. There was very little of it to be found [in 1727 Brewer had found it "for a mile together in great plenty"]; and that no more in Flower than you see. I thank you for reserving me a specimen of *Sisymbrium murale* [*Arabis stricta* from Clifton]. I had a little Bit of it: but, if it does not mar your Collection, I should be glad of a better Sample. I have enclosed two or three kinds of Confervæ which I had forgot to communicate to you, found in *Milford Haven*. I am still of Opinion that the *Oenanthe* gather'd in Anglesey must be the *Pimpinelloides* [no doubt *Oen. Lachenalii*] tho' I could not find the shadow of a radical leaf: but I shall set *Williams* to work next spring to find them.

The enclos'd *Senecio* is the true *Viscosus*, now flowering in my Garden from seeds of Plants which I found at Kirkcaldy in Scotland, & which I never yet found in England. If there are any other Plants in my Collection that you have omitted to take specimens of, or any in my Herbarium that can tend to compleat yours, I shall be most happy to contribute my *Mite* towards the encrease of your glorious Collection.

My Journal of *Habitats* [sc: the MS. of the Journey now published] is entirely at your Service. Nothing can tend more to illustrate the Botany of our Country than an encrease of these *Habitats* of the *Plantæ variores*.

Mr. Williams's Address is at Lanvair in Conwey [Llanfair yn Nghornwy] in Anglesey, North Wales. . . .

III.

Uxbridge, Sep. 3d. 73.

In the Box you will find a specimen of the *Galeopsis Eboracensis* [*G. ochroleuca* Lam.] and another of the *G. Tetrahit* with a yellow & purple Flower [*G. versicolor*], that you may compare them together. Of the first there were only two Plants growing at Bullstrode, & those just out of Flower, otherwise I would have sent you more; but this I hope will be sufficient for your Examination. There seems to be some Difference in the Calyx & Form of the Leaves, as well as a want of the Gouty swelling under the Joints of the first. Be that as it may, our Carnarvonshire kind I think is undoubtedly the same with the Yorkshire.

I shall take care to dry some of the *Senecio viscosus* for you.

I am entirely of your Opinion with respect to the *Carex atrata*. There can be no doubt of its being that Plant, after consulting *Scheuchz. Agrost.* I found it in Scotland likewise, & suspected ours to be the same as soon as I saw it. [This was one of their Snowdon finds. It is not mentioned in the MS. of the journey, but there is a Snowdon specimen from Lightfoot in the Banksian herbarium.]

I dare say you are right with regard to the Scirpus [found near Pembroke]; it appeared to me dicœcious when I gathered it, but I had not time to dissect it.

I have very great Reason to believe the *Cistus polifolius* [gathered by him on Brean Down] and *Apenninus* to be the same, & our *Cistus* from *Gloddaeth* to be the *C. marifolius* [*Helianthemum marifolium* Mill]. The Veronica from the same Place I verily believe to be the *spicata*. Pray are your specimens of that from St. Vincents Rock arriv'd? From the roots I sent which are now growing, that bids the fairest to be V. hybrida, tho' there is very little difference between the two species at best, as I yesterday observ'd by comparing the two growing together at Kew.

Thirteen Hundred Specimens of Plants from the Cape cannot fail to abound with many Monsters, & your kind Invitation to me to come & see them is too provoking for me to refuse. . . .

IV.

I have just receiv'd a Letter from my Friend, Mr. Williams, in Anglesey, containing some specimens of the *Cistus guttatus* [*Helianthemum Breweri* Planch.] with Petals. Some of them I thought might be acceptable to you. I have therefore divided the Cargo for your service. He says in his Letter that the Petals are so extremely fugacious that they will scarcely bear to be look'd at, much less preserv'd in their proper position. They are, however, I believe, much fairer samples than those you receiv'd from him when in Wales. . . .

Uxbridge. July 26th 1774.

The MS. itself, which is now reproduced, is Solander's transcript of Lightfoot's original record. It is on the whole accurate: an occasional misunderstanding of Solander's is always easy to detect, and reference to a map puts the difficult Welsh names right. Perhaps the chief interest of Solander's work for us lies in the fact that it was he who named the grass from Glamorganshire (*Festuca uniglumis* Soland. ap. Ait. Hort. Kew. i. 108, 1789) which figures prominently in the tour, and which seems then first to have been critically distinguished.*

Lightfoot's account has never before been published in full. Reference to it may, however, be found in Dryander's Catalogue of Banks's Library, vol. iii. p. 138; extracts from it have appeared—*e. g.*, in Journ. Bot. 1891, p. 269, and reference made to its records in County Floras and elsewhere: now it is given without omissions.

The excursion lasted from 25 June to 16 Aug. 1773; not 1775, as in Solander's transcript: it was the year after Lightfoot's tour in Scotland. He was living at Bulstrode at the time; there he acted as Chaplain to the Duchess of Portland. It will be of interest to trace out the motives which probably led him to adopt this particular route.

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* But see *Petiver*, Conc. Gram. No. 101, for an earlier *gathering* of the plant.

I believe that the route was planned out in one way, and executed in another. It was intended at first simply to trace Ray's steps—in reverse order, however, to that of his itinerary of 1662: and of course with the exclusion of the West of England section. In 1658, on his first itinerary, Ray worked round the north coast of Wales to Caernarvon, taking in some of Anglesey on the way; he ascended Snowdon, and worked thence to Bala, Dolgelly, Cader Idris, Mahentler (*i. e.* Machynlleth), Shrewsbury, and so on. But in 1662 he passed from Chester to Wrexham, and thence to Denbigh, whence he reached Penmaenmawr, no doubt *viâ* Rhyl and Conway. He attacked Carnedd Llewelyn, but then dropped the hills (it was full early, still May) in favour of Beaumaris, Prestholm Island, and other parts of Anglesey; on 26 May he returned to Llanberis and ascended Snowdon. Afterwards he passed south through Aberdaren, Pwllheli, Aberdovey, and Cardigan into Pembrokeshire, where he visited St. David's, Haverfordwest, Tenby, Caldy Island, Pembroke. He passed rapidly along the Caermarthen and Glamorgan coasts to Chepstow, Tintern, Gloster, Bristol, and so out into the west.

After Ray, Dillenius and Brewer made a two months' journey in 1726 through Cheddar, Brean Down, Bristol, and thence north to Shrewsbury, where they turned westward—reversing Ray's 1658 route—to Cader Idris, Carnarvon, Anglesey, and Snowdon. The following year was spent by Brewer (who lived then at Bangor) in studying the flora of Anglesey and Carnarvon; the account of his work being contained in a MS. (also Solander's transcript) now at the British Museum.

Now, Lightfoot and Banks evidently meant to take in Cader Idris: *cf.* the letter of 19 June, 1773, above. The visit to Pembrokeshire was no doubt part of their original plan, and they at first thought of going up the west coast of Wales to Snowdon, doing the Barmouth district on the way. Two reasons account for a change of route. They spent a longer time in Pembrokeshire than they had meant to do, and at last it became a choice between Snowdon and Cader Idris. There could be no hesitation: Cader must be dropped. But, secondly, Mr. Holcombe, the Pembrokeshire clergyman, roused their interest in the flora of Mid-South Wales, and they opened up new ground by making across, at the foot of the Black Mountain range, to Hereford. This would further suit their convenience, as they *had* to renounce Cader, because travelling would be more rapid along the good roads and through the larger towns of the West Midlands than through the primitive districts of the west coast of Wales, though the mileage of the latter route would be less; it only took a week—26 July to 2 Aug.—to travel from St. David's through Hereford and Chester to Bangor and Llanberis; this was quick going, and at the same time it opened up a new and interesting route through Llandovery and Brecon.

The itinerary therefore worked out as follows:—Bath, Keynsham, Bristol with St. Vincent's Rocks, Chepstow and Tintern, Cardiff with Dinas Powys and Porthkerry, the Holmes and Brean Down, all well-known hunting grounds, some famous from Ray's time, some from an even earlier date. Then the coast of Glamorgan,

via Cowbridge, St. Donat's, Briton Ferry, and the great Crumlin Bog, near Swansea, seems to have opened much new ground. It is the most original part of the journey, except the dash across Brecon-shire, so far as our records go. Ray crossed the county of Glamorgan, but his itinerary hardly mentions it: he was pressing on to Devon and Cornwall. A short stay near Talley, in Caermarthen-shire, was followed by a prolonged investigation of the Pembroke-shire coast, under the guidance of Ray's records and Mr. Holcombe's companionship. Thence they harked back across South Wales to Hereford, Shrewsbury, and Ellesmere; and so to Conway and the coast and hills of Carnarvonshire and the familiar ground of Anglesey. Thence they returned to London *via* Chester and Staffordshire, solving several interesting problems on the way, and discovering, or at least noting the discovery of *Cyperus longus* in Flintshire.

On the whole, therefore, they kept pretty closely to the beaten track both at Bristol and in Wales; the large majority of localities mentioned occur and recur in the old botanical records, some of them in the oldest.

Of the local Welsh botanists named by Lightfoot—Mr. Holcombe, Skinner, Williams, Davies—the first and last are best known. The former, a Pembrokeshire clergyman, was a correspondent of Sir John Cullum and of Lightfoot; he was no doubt partly the cause of Pembrokeshire being selected as one of the important stages of the journey. The late Professor Babington pointed out (Journ. Bot. 1886, 22) that a letter from this gentleman to Sir John Cullum, dated 6 June, 1775 (in Cullum's Letters, vol. i. No. cxxviii., now at Hardwick House, Bury St. Edmunds), two years after this expedition, proves that it is he himself who deserves the credit of having discovered several plants which are generally ascribed to Cullum, Banks, and others—e. g., *Brassica oleracea* and *Lavatera arborea* near Tenby; *Convallaria Polygonatum* in the very spot where Lightfoot saw it: the well-known locality for *Cyperus longus* at St. David's—"in a little gully about $\frac{1}{4}$ mile above Whitesand Bay"—"which rests on the authority of Sir J. Cullum & Sir Joseph Banks as growing near St. David's" is really his; while he claims to be the discoverer of *Sison* (*Carum*) *verticillatum* in Britain: not, however, with justice. Newton, in Ray Hist. ii. (1688), must have the credit of the discovery.

The Rev. Hugh Davies, of Beaumaris, is only mentioned once; he is the author of the Welsh Botanology and other works, but requires no detailed notice in this place.

The plan of Lightfoot's record does not include a complete list of the plants he encountered. He aimed only at the mention of the rarer plants, or a criticism of former records. In the body of the text, editorial remarks, usually short and dealing with nomenclature or other records, have been inserted within square brackets. Comparison has been made between Lightfoot's account and the localities recorded—*e. g.*, in the *Flora of the Bristol Coal-field* (J. W. White); *Flora of Somerset* (R. P. Murray); and the *Flora of Anglesey and Carnarvon* (J. E. Griffith).

Journal of a Botanical Excursion in Wales.

Friday June 25.

In the Road going from Bath to Bristol, about ½ Mile beyond Caynsham [Keynsham, v.-c. 6] upon a Bank on a little rising Hill on the right Hand of the Road, found the *Ornithogalum pyrenæicum*. Caynsham is about 4 or 5 miles from Bristol.

Found this same Day upon St. Vinc. Rock [v.-c. 34] & its neighbourhood the following Plants:

Potentilla verna, plentifully near the May-Pole.

Scilla autumnalis, upon the 2$^{d.}$ point or projection of the Rock, before you come to the Lime-Kiln, in going from the Wells. [Ray saw it here: the *Flora of Bristol* says there are no records of it since about 1860.]

Veronica hybrida, on the Ledges of the Rock going down to the Giants-Cave.

Sisymbrium murale? [*Arabis stricta* Huds.] a few plants of what we imagined to be this upon the Ledges of the Rocks, beyond the *new wellhouse* a little above high water mark. It was out of Flower, and from its Appearance must have flowered in the Beginning of May. [In Solander's writing "Arabis hispida" is added in the margin. Lightfoot's letter of 24 Aug. 1773 seems to show that the discovery of the plant's identity was Solander's or Banks's: yet *Arabis stricta* was known in the locality, since Ray gathered it in 1686.]

Trifolium maritimum in a low meadow by the Rivers Side beyond the *new wellhouse* towards Cook's Folly, plentifully.

Tragopogon porrifolium, in the same meadow as above. [This throws the record back: the *Flora of Bristol* says "possibly native with us. First recorded as a Bristol plant by Mr. Sowerby, towards the end of last century."]

Sedum rupestre, in the Rocks near the Wells ["var. β minus" *Fl. Bristol*].

Peucedanum minus of Huds. [*Trinia glaberrima* Hoffm.] on the Rocks just above the Wells: vide et compar. *Seseli pumilum* L. Sp. Pl. et *Pimpinella pumila* L. Mant. p. 357 et *Peucedanum minus* Mantiss, p. 219, an non omnes eædem?

Lepidium petræum [*Hutchinsia petræa* R. Br.] on the Rocks above the Wells: it flowers in May.

Geranium hæmatodes [*sanguineum*] upon the Rocks above the Wells etc.; common.

Rubia tinctoria [*peregrina*] it grows out of the Rocks on both sides of the River [v.-c. 6 and v.-c. 34].

Ophrys apifera by the Side of the Footway going to the new Well-House ["almost eradicated," *Fl. Bristol*].

Ophrys muscifera in a wood just under *Cooks Folly*: plentifully. Mr. Banks. ["Still there, but rare," *Fl. Bristol*.]

Asparagus officinalis in the Salt Marshes below Cooks Folly. Mr. Banks. [Ray, *Syn.* gives this locality as Look's Folly. Not *A. prostratus* Dum. but only a denizen, according to *Fl. Bristol* cf. *Top. Bot.*]

Chlora perfoliata by the Footway going to the new Well-House by the River Side. [The plant has been known from this spot since 1570 (Lobel Adv.).]

Bromus tectorum [*B. madritensis* L.] upon the Rocks above the Well.

Spiræa Filipendula upon the Rocks about the May-pole.

Saturday June 26.

Upon a high Bank by the River Side, just above Aust Passage [v.-c. 34] found again *Trifolium maritimum*. [The locality is not in *Fl. Bristol*, though it appears to be within the area covered by it.]

Sunday June 27, found

Alopecurus bulbosus in the Marshes by the Severn Side going the Foot Way from the new Passage House to Chepstow in Monmouthshire [v.-c. 35] plentifully. N.B.: it very much resembles the *Alopecurus geniculatus*, but is readily distinguished from it by the Roots.

Brassica maritima [*oleracea* L.] upon Chepstow Castle. [Not in *Top. Bot.* for v.-c. 35. Dr. Shoolbred tells me it is on the cliffs below Chepstow Castle. Perhaps not native here ?]

In Piercefield Woods near Chepstow found

Hordeum sylvaticum [N.C.R. for v.-c. 35. Dr. Shoolbred has no other record].

Triticum caninum, *Bromus tectorum* [*B. madritensis* L. and a N.C.R.], *Rubia tinctoria* out of the Rocks, *Melica nutans* var. *β*.

Sedum rupestre upon the Rocks on both Sides of the Wye above and below the Bridge at Chepstow [v.-c. 34 and 35].

Ophrys apifera, *O. muscifera*. On the Steep nacked [naked] Bank by the Side of the Wye not far from the Castle.

Serapias angustifolia, *Geranium sanguineum*. In the hanging wood near it. Upon wind cliff near Chepstow plentifully [v.-c. 35] and upon the Rocks near Chepstow Bridge on the Gloucestershire Side [v.-c. 34] together with *Rubia tinctoria*, *Sedum rupestre*. [*Serapias angustifolia* must be *Cephalanthera ensifolia* Rich. which Dr. Shoolbred informs me is abundant in the Castle Wood. It is not recorded for v.-c. 35 in *Top. Bot.* ed. 2. Most likely the record for the *Serapias* is not meant to extend beyond "the hanging wood."]

Monday June 28 found

Anchusa sempervirens between the 4 and 5 milestones on the right hand going from Chepstow to Lidney in Glocestershire [v.-c. 34. Still there, W. A. S.] in Mr. Bathurst's Woods at Lidney going from his House to a place called the Scowles found *Ophrys Nidus Avis*, *Astragalus glycyphyllos*, *Colchicum autumnale*, *Rhamnus Frangula*, *Hypnum alopecurum*, *Orchis ustulata* [this last a new record for v.-c. 34: it is known from v.-c. 33] upon the Grass near the Summer House in the Wood.

Tuesday June 29.

Found near Tintern Abbey a few specimens of *Euphorbia platyphyllos* [*E. stricta* L.] by the Brook Side, going from the Abbey to the Forge where they make wires.

Mentha rotundifolia near the same place, and likewise just over Chepstow Bridge on the right hand, in an orchard on the Glocestershire Side of the River.

Thursday July 1.

Leonurus cardiaca at Christchurch, a village between Cairwent and Newport in Monmouthshire in a Hedge on the right just entering the village. [*Cf.* Smith, *Eng. Flora*, 3, 105, "Monmouthshire, Lightfoot in his herbarium."]

Friday July 2.

Search'd the Rock near Dennis Powis Castle in Glamorganshire [v.-c. 41] in vain for the *Polypodium Cambricum* said to have been found there. [Ray's *Fasciculus* 1688 gives the locality.]

Adiantum capillus veneris verus upon a Cliff facing the Sea, call'd 9 acre Cliff, ½ Mile from Porth Kirig church [Porthkerry] in Glamorganshire. It grows within Reach near the Bottom of the Cliff, where water ouzes from the Rock. [Found there by Ed. Lhwyd in 1698: *Phyt.* n.s. i. 268.]

Lithospermum purpurocæruleum at the West End of the same Cliff at the Top among the Bushes. It flowers in the Beginning of June. [This seems to be the earliest notice of it in v.-c. 41.] *Linum tenuifolium* [*L. angustifolium* Huds.] *Trifolium scabrum*, *striatum* [this last a N.C.R.], *Ophrys apifera*. N.B. This Cliff was made up chiefly of Lime Stone. [The rock is blue lias. Ed. Lhwyd's letter to Dr. Richardson, 19 Sepr. 1698, recording the *Maidenhair*, *cf.* supra, also describes the soil:—"Growing very plentifully out of a marly incrustation both at Barry Is^d. and Porthkirig in Glamorganshire, and out of no other matter." My experience in the county is also that this fern occurs in wet oozy spots on the lias cliffs, and nowhere else. *Cf.* Dillwyn, *Fauna and Flora of Swansea*, 1848.]

Saturday July 3.

In the Island called the flat Holmes [part of Glam., v.-c. 41] found the following Plants: *Allium ampeloprasum* near the landing Place [*cf.* Ray, *Hist.* 1688]. *Geranium* [*Erodium*] *maritimum* all over the Island in great Plenty. *Cochlearia danica?* [Yes: specimen is in the British Museum Herbarium] upon the Rocks on the North Side of the Island. *Ophrys apifera*. *Crithmum maritimum* upon the Rocks abundantly. *Poa loliacea* Huds. [*Festuca rottboellioides* Kunth].

Upon the Steep Holmes [part of Somerset, v.-c. 6] the following: *Smyrnium Olusatrum* [recorded from this spot by Turner, 1562] and *Ligustrum vulgare* are the prædominant plants upon the Top of the Island, which totally cover it, a little of the *Conium maculatum* is mixed with it.

Upon the Rocks on the South Side grow *Inula crithmoides* [first record for the locality, the only one given in Murray's *Fl. Som.*], *Crithmum maritimum* [antedating T. B. Flower's record given in *Fl. Som.*], *Statice Limonium* [no doubt *Limonium occidentale* O. Kuntze, and its earliest known occurrence in the county, *cf. Fl. Som.*], *Asplenium marinum* [a new locality for dist. 9 in Som. N.], *Lavatera arborea* in inaccessible Places near the Top of the Rocks, *Allium ampeloprasum* near the Stone Gateway at the Landing Place.

Euphorbia Lathyris Mr. Banks found one plant of it upon the Island. [Mr. Clarke's *First Records* gives 1805 as the earliest British record for this species.]

Geranium maritimum not so plentifully as at the flat Holmes.

Cistus polifolius upon the Top of a peninsula call'd brean down a mile from Uphill in Sommersetshire, facing South West, at this Time in full flower. This Down is about 2 miles from the Steep Holmes.

Ruppia maritima [*R. spiralis* Hartm., which has been recorded from this locality several times since; see *Fl. Som.*] in the Ditches in the Marsh going from Brean Down to Uphill.

Monday July 5.

Went to Rumney Marshes about 2 miles from Caerdiff [but in Monm., v.-c. 35] where we saw large crops of the *Plantago maritima* call'd here by the people *Gibbals*, which the Hogs are very fond of. They rout up the Roots as we saw, and grow fat upon them, as were assured. In the same marshes we saw abundance of the *Alopecurus bulbosus* and *Hieracium paludosum ?* [If *Crepis paludosa* Moench is the plant meant, it is a very unusual situation for it.]

Cowbridge in Glamorganshire [v.-c. 41] found the following Plants: *Mentha longifolia*, by the Mill going to St. Quintins Castle a mile from Cowbridge, and in a wet marshy meadow on the left going to the Mill, found *Ranunculus lingua* [otherwise unrecorded from the spot: I could not see it there 1904].

Tuesday July 6.

Went to St. Donat's Castle, situate upon the Coast near Nash Point [v.-c. 41]; found *Adianthum capillus veneris* upon Nash Point facing the Sea, several Patches of it, but upon very high inaccessable places.

Asplenium marinum in the Caves and Crevices of the Rocks at Nash Pt.

Mentha rotundifolia in St. Donats Church yard and other places there about.

Breton Ferry, near Neath in Glamorganshire
Wednesday July 7, found

Cheiranthus sinuatus [*Mathiola sinuata* R. Br.] a quarter of a mile before you come to Breton Ferry, on a Sandy Bank, on the right hand by the Road Side from Bridge End. [First notice for the county: only one for the locality.]

Upon Breton Sands the following:—*Salix arenaria* [f. of *S. repens* Linn.], *Arundo arenaria* [*Ammophila arundinacea* Host], *Triticum junceum* [not in *Top. Bot.* ed. 2, yet recorded by Westcombe in 1843, *Phyt.* i. 780, from this neighbourhood, &c.], *Eryngium maritimum*, *Salsola Kali*, *Arenaria peploides*, and a nondescript Grass of the Habit of *Festuca Bromoides* [i. e., *F. sciuroides* Roth: the new grass was described and named by Solander in 1789, as *F. uniglumis*] but having only one Gluma calycina and growing erect.

A yellow flowered violet which seemed to be only a variety of *Viola tricolor* [*Viola Curtisii* Forster. First recorded for certain under this name by the Rev. W. R. Linton, 1886].

Euphorbia paralias. *Asplenium marinum* out of the Crevices of the Rocks near too where the Cheiranthus above-mention'd grows.

Thursday July 8.

Upon the Sands going from Breton to Swansea on Foot, besides most of the sand Plants of the preceding Day, *Convolvulus Soldanella.*

On our right Hand 2 miles from Breton ferry and about ¼ of a mile from the Sea, we observ'd a marshy Lake extending a mile in Length, call'd Coars Crym Lyn [Crumlin Bog] in which we found plenty of the *Typha angustifolia*, *Schœnus mariscus*, *Nymphæa alba*, *Hydrocharis Morsus Ranæ* [not in *Top. Bot.* ed. 2, and almost the only locality for the plant in the county. I have seen it in one other part of the marshes round Swansea Bay. N.C.R.].

Upon the marshy Tufts in the Lake *Osmunda regalis*, *Myrica Gale*, *Hypericum elodes*, *Carex pseudo-Cyperus* [first and only record for the county], *Carex paniculata* [the first published record is by E. F. L. in *J. B.* 1886], *Geranium cicutarium Flore albo* frequently upon the Sea Sands [this may very likely refer to var. *glandulosum* Bosch].

July 11.

Campanula hederacea on the Sides of the Bowling Green at Mr. Hodgkinson's at Edwins Ford in Carmarthenshire [v.-c. 44] and in the low moist meadows by the River Side at Caunmer Cothy about 2 miles from Edwinsford in Plenty.

In Tally Pool near Edwins Ford, the following:—*Lobelia Dortmanna* [new record for v.-c. 44], *Isoetes lacustris* [first published for Caermarthenshire in 1902], *Littorella* [N.C.R.], *Carex vesicaria* and its variety.

At a place call'd *fresh water cast* [Freshwater Bay East, on the map] 3 miles from Pembroke [in v.-c. 45] by the Sea Side on a sandy Shore, found *Cheiranthus sinuatus*, *Euphorbia paralias*, and the new grass found before at Breton Ferry [*Festuca uniglumis*], *Triticum junceum* [? recorded for v.-c. 45], *Eryngium maritimum*, *Convolvulus Soldanella.*

At Tenby in Pembrokeshire and its neighbourhood the following:—*Brassica maritima* upon the Bank and Rocks on the East and South Side of Tenbigh Town abundantly. *Euphorbia portlandica* on the East Side of the Town, at the foot of the Rocks, where the Shore is sandy, several plants of it. *Rubia Tinctorum* [*R.*

peregrina] at the same place very rampant: and half way up the Bank under the Town a few plants of *Agrostemma coronaria* probably thrown out of a garden.

Lavatera arborea upon the Rocks on the South Side of the Town facing caldy Island.

Asplenium marinum, *Inula crithmoides*, *Crithmum maritimum*, *Statice Limonium* upon the same South Rocks and in the Caves.

Lavatera arborea and *Euphorbia portlandica* Mr. Holcombe assured me grew likewise upon caldy Island.

Upon white Sands a mile west of Tenbigh [Penally Burrows], *Euphorbia paralias*, *Salix arenaria*, *Convolvulus Soldanella*, *Juncus acutus*.

Upon a high rock in white Sands, *Convallaria polygonatum* [*P. officinale* All.], *Thalictrum minus*, *Rubia Tinctorum*.

Leonurus cardiaca in waste places about Tenbigh Town on the South Side.

Aegilops incurva at the Foot of Pembroke Castle. [*Lepturus filiformis* Trin. Specimen in British Mus. Hbm. "Under the walls of Pembroke Castle. Mr. Lightfoot."]

Monday July 19.

Went to *Stackpole Warren* 7 miles from Pembroke, near the Sea Coast, where I found great plenty of *Euphorbia portlandica*.

Eryngium maritimum and the new Festuca [*F. uniglumis*] of Breton Ferry with several others of the more common Sea sand plants.

Linum tenuifolium [*L. angustifolium* Huds.] on a dry Bank going from Stackpole to St. Gowens Chapel.

Scilla bifolia [*S. verna* Huds.] and a small variety of *Plantago maritima* in great abundance upon the Sea Coast at St. Gowens et Bosheston Meer for 7 miles together upon the rocky Shore, slightly cover'd with Earth.

Upon the Rocks at a place call'd The wash at Bosheston Meer grew *Inula crithmoides* plentifully, *Asplenium marinum*, *Crithmum maritimum*, *Statice Limonium*.

Geranium maritimum in sandy places at Bosheston Meer et thereabouts.

At *Fresh water West* on the above Coast by a Ditch Side, *Ranunculus lingua*. *Scirpus dioicus* which seem'd a new species, but very much resembling *Sc. palustris*. [The letter of 3 Sept. 1773, *v. supra*, seems to imply that this distinction was abandoned by Lightfoot at Banks's suggestion.]

Lavatera arborea upon Thorn Isle and Stack Rock, two little Islands near the mouth of Milford haven.

Friday 23.

Sison verticillatum [*carum*] in a low moist meadow on the left hand of the Road adjoining to a smal bridge call'd Pelcombe Bridge 1½ miles from Haverford West in the way to St. Davids, in Abundance in Flower.

By a ditch side in the same meadow *Scirpus sylvaticus*, *Osmunda*

regalis, found the same *Sison* again ½ mile further on the same Road towards St. Davids, in a low moist place on the right hand, and a mile farther in another meadow on the left hand, each place close to the Road.

Cyperus longus two miles from St. Davids by the side of a small Rivulet in a Place call'd White Sand Bay, ½ mile south of St. David's Head. Between that and a farm House call'd Trelethen, and not above ¼ of a mile up the Rivulet from the Sea. It grew in one place only in a large Lump, and seem'd as if it would be in full perfection about the middle of August. [Ray found the plant at Haverfordwest, 1662.]

Scilla bifolia, *Sedum rubens* [*S. anglicum* Huds.], *Plantago maritima varietas minor*, *Geranium maritimum* all upon St. David's Head and other Rocks there about.

Saturday July 24.

Lavatera arborea upon the North of the Rocks call'd the Bishop in Abundance, and upon the Isle of Ramsay. *Scilla bifolia* upon the same Isle.

Monday July 26.

Sison verticillatum in going from Haverford west in Pembrokeshire to Narbarth, ½ mile before you come to Narbarth Town, ascending a Hill in a moist meadow on the right Hand close to the road in abundance. The same again about 3 miles from Narbarth going to St. Clears at a place call'd Lanreed in low moist meadows on the right and left. Again in Carmarthenshire in a moist meadow on the right by the road Side just before you come to the Bridge over the River at St. Clears. The same afterwards for 6 miles together in almost all the low moist meadows between St. Clears and Carmarthen. The same again between the 3 and 4 mile stone from Landily to Landovery in the pastures on the left by the road Side. The same again observ'd by Mr. Banks in moist and boggy Grounds about Edwins Ford in several places. We both observ'd it afterwards in several places by the Side of the Road in meadows going to Landovery from Edwins ford so that it is a common plant in moist and boggy meadows in the 2 Counties of Pembroke and Carmarthen.

Sambucus ebulus at Llandovery Castle [v.-c. 44, N.C.R.].

Antirrhinum repens [*Linaria repens* Mill. N.C.R.] a mile from Llandovery on the left ascending a hill going from thence towards Trecastle, a few plants only.

Orobus sylvaticus [*Vicia Orobus* DC.] at the foot of the black mountain in the hundred of Hwyuva upon Land belonging to Mr. Lewis—Mr. Skinner. [No doubt = the hundred of Gwinfe in the Parish of Llangattock, v.-c. 44.]

Rhodiola rosea upon Brucknock Van, observ'd by Mr. Skinner [v.-c. 42].

Campanula patula by the road Side between Brucknock and Hay.

Viola sylvatica Six miles from Hereford in Road to Leominster [v.-c. 36] ascending a Hill on the right.

Cicuta virosa about 3 or 4 miles from Shrewsbury in the Road to

Ellesmere in a muddy Pond on the left hand of the Road [v.-c. 40]; and again just at the Towns End at Ellesmere in a small muddy Pond, on the left in the Road to Wrexham.

Geranium maritimum all about Conway in Carnarvonshire [32 years earlier than the present record for v.-c. 49] frequently.

Lepidium latifolium at Abergely [v.-c. 50].

Geranium maritimum at Bangor [v.-c. 49] in the College churchyard walk.

Galeopsis eboracensis [*G. ochroleuca* Lam.: throwing the record back 29 years] or yellow yorckshire Ironwort in the cornfields and upon the mud walls about 2 miles from Bangor in the Road to Lanberis.

Monday Aug. 2.

We ascended the Top of Snowdon and found the following Plants *Papaver cambricum* [*Meconopsis cambrica* Vig.] ascending the Hill. *Jungermannia alpina* [*Andræa alpina* Sm.], *rupestris* [*A. Rothii* Web. & Mohr], *julacea* [*Anthelia julacea* Dum.]: upon Rocks in moist places. *Lichen paschalis* [*Stereocaulon paschale* Fr.] upon Rocks plentifully.

Upon the Ledges of the Rocks facing the North at Clogwyn y Harnedst [Clogwyn Garnedd] near the Summit of Snowdon, the following *Saxifraga hypnoides, stellaris, oppositifolia, nivalis, Cerastium latifolium* [probably *C. arcticum* Lange], *Serratula alpina* [i.e., *Saussurea*], *Poa alpina, Rhodiola rosea, Arenaria saxatilis?* [*A. verna*].

In Phynon Vrech [Ffynon Frech] found *Lobelia Dortmanna, Subularia aquatica, Isoetes lacustris.*

And in the Crevices of the Rocks above Phynon Vrech, *Trichomanes viride* [*Asplenium viride* Huds.; the next record for v.-c. 49 is 1805].

Wednesday Aug. 4.

Went to Rhiwr Glyder on the other Side of the vale of Llanberis, and in Llyn y Cwn found *Isoetes lacustris, Subularia aquatica, Lycopodium annotinum* about 200 yards directly above the lake among the Stones on the Side of Glyder.

Upon Clogwyn du Ymhen y Glyder or the black precipice at the end of Glyder found *Saxifraga nivalis, Rubus saxatilis* [both recorded otherwise not earlier for v.-c. 49 than 1788].

Serratula alpina: Trollius, but no *Bulbocodium* [*Lloydia*] either here or at Trig y Fylchen a Rock just by where it is said to grow.

Plantago montana Huds. just above the lake call'd Llyn Bocklyn [Llyn Bochlwyd?] at the foot of Trig y Fylchen. N.B. This is no other than a variety of *Plantago lanceolata* with a round head.

Hieracium alpinum returning from Clogwyn du upon the Rocks on the Top of Glyder.

Thursday Aug. 5.

Search'd the Rocks call'd Clogwyn du yr Ardhu in Company with Mr. Williams for the *Bulbocodium* but in vain, probably it was not at this Time in Flower.

Found upon these Rocks *Serratula alpina, Cardamine petræa* [*Arabis petræa* Lam.], *Thalictrum alpinum, Aira cæspitosa viripara*

[*? Deschampsia alpina* R. & S.], *Polypodium lonchitis* [*Polystichum*], out of the Crevices of the Rocks above Phynon Las [Ffynon las] on the Crib y distilh Side.

Viola alpina Huds. mention'd to grow above Phynon Las, for what I could discover was no other than *Viola palustris*.

Alisma natans just below Dolebadan Castle near Llanberis in a deep Ditch by the Lake.

Satyrium albidum [*Habenaria albida* R. Br.] in the pastures by Dolebadan Castle. Mr. Davis of Beaumaris found it.

Juncus triglumis found by Mr. Banks upon the Rocks of Iscolion Duon [Ysgolion Duon] going to Carnedh-Lewellyn.

Anglisea Island Aug. 7.

In the Sands near Abermenai Ferry [v.-c. 52], *Sisymbrium monense* [*Brassica monensis* Huds.], *Arundo arenaria*, *Salix arenaria*.

Euphorbia portlandica at Llandwyn Sands, but in no great plenty. *Athanasia maritima* among the Sands at Llanfaelog on the west Side of the Island, but only a few plants and those not yet in Flower. It flowers in Sept.

Polygonum maritimum ? at the same place with the Athanasia but it seems to me to be nothing but a variety of P. avicularia magnified and rendered more succulent by the Spray of the Sea. [Probably a form of *P. aviculare*. There is no certain record of *P. maritimum* L. from v.-c. 52.]

Cistus guttatus [*Helianthemum Breweri* Planch] at Gadar in the Parish of Llanvair in Cornvey [Llanfairynghornwy] at the North End of the Island facing the Skerries about ½ mile from the Sea upon the Rocks where was little Earth in an open expos'd situation, in great abundance among the *Sedum rubens* and *Scilla bifolia*. It flowers in June. [Brewer discovered the species in 1726, nr. Holyhead.]

Pulmonaria maritima among the Stones upon the Sea Shore at Cemlyn Bay 2 miles from Llanvair in Cornvey on the North Side of the Island.

Œnanthe pimpinelloides ? [see the letter of 24 Aug. 1773. *Œn. Lachenalii* C. Gmel. no doubt] near the *Pulmonaria* above, in a wet marshy Place. This however remains to be further examin'd, as I could not find the radical Leaves.

Polypodium cambricum grew upon the garden wall of Mr. Holland at Conway [v.-c. 49 : new county record] in Carnarvonshire ; but he has now taken it up, and received it into his garden. It is certainly no other than a variety of the *Polypodium vulgare*, corresponding to Doubleness in regular Flowers.

Wednesday Aug. 11.

At Gloddaeth [v.-c. 49] the Seat of Sir Roger Mostyn 1½ miles from Conway upon the Rocks in his woods found the following rare plants : *Scilla bifolia*, *Cucubalus viscosus*, *Silene nutans ?* both these out of Flower. [Both refer to *S. nutans* L. cf. Sm. *Eng. Fl.* 2, 297]. *Arenaria saxatilis* seu *laricifolia* [*A. verna* L.], *Veronica*

hybrida in the greatest abundance. *Geranium sanguineum*, *Rubia Tinctorum*, *Hypericum montanum*, *Potentilla verna*, *Cistus hirsutus* Huds. [*Helianthemum marifolium* Mill.] plentifully but out of Flower. It flowers in June. *Thalictrum minus*, *Scrophularia verna* in the Lane near the Gate, just before you come to Gloddaeth from Conway.

Cyperus longus found in the marshes by the Sides of the Ditches near Harding in Flintshire [v.-c. 51] going from thence to Chester by Mr. Cheffield and Williams. [N.C.R. Perhaps the two persons mentioned are the discoverers. This is, with the exception of *Festuca uniglumis*, the most interesting of all the additions made in this paper to our knowledge of British topographical botany. *C. longus* is known from Cornwall West, Somerset North, Wilts South, Dorset, Wight, Kent East, and Pembroke, and reported (apparently in error) from E. Norfolk and Stafford. It has thus, according to its ascertained distribution, a distinctly Southern, or Southwestern range in Great Britain. It occurs neither in Scotland nor Ireland, "but is abundant in the Channel Islands." If we exclude v.-c. 27 and 39 as erroneous, the occurrence in Flintshire is a remarkable extension of the known range of *C. longus*. The Rev. G. C. Joyce of "Harding," *i.e.*, Hawarden, whom I have consulted concerning the locality, writes to me that in 1773 "there were marshes between Hawarden and Chester, afterwards reclaimed by the embankment of the Dee. I presume that the boundary between the counties ran then where it does now. In that case—and judging that what is now low-lying flat ground was then marsh—by far the greater part of the marshes was in Flint. . . . . There are no longer marshes between Hawarden and Chester, but . . . marshy ground covers a good deal of space lower down the river. It is covered with water at spring tides." The drains and ditches of the reclaimed land, and the unreclaimed marsh lower down the Dee, may still reward the search for *C. longus*.]

Friday Aug. 13.

Search'd the Banks of the River below Chester [v.-c. 58] in vain for the *Silene armeria* said to grow there. I think this plant ought to be eras'd out of the British Catalogue. [Ray, *Syn.* ed. 3, p. 341, records it on Dr. Richardson's authority.]

Search'd Horseley Hill near Beeston Castle in Cheshire for the *Melampyrum arvense* and the cornfields there about but could find no other than the *M. sylvaticum* some of the Flowers of which were ting'd with red. Q. Did not Mr. Vernon mistake this for *M. arvense?* [Lord de Tabley, *Fl. Cheshire*, pp. 218–220, records *M. pratense* L. alone from this locality and indeed from Cheshire.]

Common Parsley in a pasture at the foot of Horseley Hill plentifully, on the side next Beeston Castle.

The gardener at Shugburgh shew'd us the *Euphorbia amygdaloides* as the only kind of Euphorbia growing on the Mill Dam in Hoywood Park [v.-c. 39 Staffs] where the *Euph. characias* was said to have been found. There is probably some mistake concerning this plant, so that it does not merit a place in the English flora.

Monday Aug. 16.

return'd to London.

[Additions to *Topographical Botany* thus are 12 (14) *viz.* :—

v.-c. 34. W. Glos. *Orchis ustulata.*
35. Monm. (*Brassica oleracea*), *Cephalanthera ensifolia*, *Bromus madritensis*, *Hordeum sylvaticum.*
41. Glam. *Trifolium striatum*, *Hydrocharis Morsus Ranæ*, *Carex Pseudo-Cyperus.*
44. Caerm. (*Sambucus Ebulus*), *Lobelia Dortmanna*, *Littorella lacustris*, *Linaria repens.*
49. Caern. *Polypodium cambricum.*
51. Flint. *Cyperus longus.*]

SHORT NOTES.

Capture of Dragon-flies by Sundew (p. 280).—On three occasions at least I have seen dragon-flies caught by sundew; in each the captor was *Drosera anglica*. The dragon-flies were small species, two of them bright blue in colour, and one dark brown. In each instance more than one leaf was involved in the struggle, which, to judge from the insect's contorted attitude, had been a severe one. The upright habit of *D. anglica* confers upon it a much greater liability to capture large insects than is afforded by the more spreading leaves of *D. rotundifolia*, and an insect caught by one leaf is liable, by its struggles, to find itself beset by the whole ring of leaves.—R. Lloyd Praeger.

Walney Island Plants: a Correction (p. 276). — May I be allowed to call Mr. Druce's attention to the record for *Pneumaria maritima* in Top. Bot. ed. 2, p. 326, "69 Westm., Miss Hodgson, sp." The record means that Miss Hodgson found the plant in area 69, in which there is no place but Walney where it could occur. No doubt there is a specimen in the British Museum Herbarium from Miss Hodgson's collection.—S. L. Petty.

When I wrote my note, which appeared on p. 274, I had forgotten that this island is included in Westmoreland by Mr. H. C. Watson in *Topographical Botany*, and not in Lancashire as therein stated.—G. C. Druce.

[Miss Hodgson's specimens from Walney Island are in the British Herbarium of the national collection, where is also a specimen collected by Dawson Turner in the same locality.—Ed. Journ. Bot.]

NOTICES OF BOOKS.

Fragmenta Phytographiæ Australiæ Occidentalis. Von L. Diels und E. Pritzel. Leipzig: W. Engelmann. 1905. (Extracted from Engler's *Botanische Jahrbücher*, Bd. xxxv. Heft 1–5.)

This important memoir is a record, nearly six hundred pages long, of excellent and faithful work, of which the foundations were laid during the authors' travels in the years 1900–1. One rises from the perusal of it with a lively sense of the devotion to science and of the efficient equipment for botanical exploration which are manifested in its every page. Here is indeed an object-lesson, such as perhaps has never before been given, of the facilities railway travel can give to the naturalist who is ready and able to avail himself of this most useful adjunct to floristic and faunistic study in the field. By these means a few months have sufficed to bring together a mass of information which, but a few years ago, would have been considered, and rightly so, no unworthy outcome of the labour of as many years. Of course railways have been used before now by the botanical traveller in little-known countries; but we are acquainted with no other memoir wherein are embodied such a large array of facts acquired by returning again and again to the same points of observation. It is as if we had the notes collected by a number of persons, set to report the order of nature throughout the floral year, each in his own particular district, and all of them equally well qualified for the task of so reporting.

The country visited by the authors is mapped out into eight floral districts. Of these, Irwin, Darling, Warren, and Eyre are littoral, Avon and Stirling partly littoral, Austin almost entirely, and Coolgardie entirely desert. In all of these, even those supposed to have been thoroughly searched by Drummond, Preuss, and their followers, they have succeeded in finding new species, and they also describe a small sprinkling of new generic types. Considering the limitations of time, they were doubtless wise to devote themselves largely to the richer flora of the coastal regions; but they traversed the desert to the head of the Murchison railway at Cue, and further south went as far as Coolgardie and Menzies; in addition, the inhospitable country lying between Coolgardie and the sea at Esperance Bay was passed over. Though this part of the work leaves much to be desired, the authors have been fortunate in enlisting the services of residents in the desert, notably Mr. W. J. George, of Murrinmurrin, who have helped materially to swell their collections from the interior. One should also mention their visits, doubtless very hasty ones, to places upon the north-west coast, especially Cossack and Roebourne—visits yielding a fair proportion of novelties, as would be expected, since the north-west is still but little known botanically.

In treating of the respective natural orders an account dealing in an interesting manner with facts of distribution and œcology is usually given by way of prefix. Much of this information, particularly that relating to distribution, the expert is already familiar

with—in short, it is simply compilation; nevertheless it will doubtless be welcomed by that ever-growing class of persons who, with every desire to assimilate the results of discovery, have neither time nor opportunity to consult the long array of memoirs wherein such results are enshrined. And the rest of the work is far from being a mere description of novelties. The kind of soil and general surroundings affected by each plant mentioned, points hitherto but little dwelt on, have been carefully recorded, and in a few cases—*e. g.*, some of the genera of the *Chloantheæ*, that curious tribe of *Verbenaceæ*—we are favoured with an elaborate clavis of the species. Most valuable, too, are the woodcuts intercalated with the text, of which there are no less than seventy grouped figures comprising together several hundred individual cuts. It were to be hoped that this lead could be followed in England, as the value of a memoir is thereby greatly enhanced, and at much less cost than would be necessary to the production of elaborate plates.

Of new species the most noteworthy is *Tetraria australiensis* C. B. Clarke, a member of a genus till now known only from South Africa. The total number of novelties is as many as two hundred and twenty-six, most of them from the littoral districts. In my memoir on the flora of the interior of Western Australia (Journ. Linn. Soc. xxxiv. p. 230), after collecting all references to plants gathered east of the one hundred and eighteenth degree of latitude (of the one hundred and nineteenth degree in the extreme south), I found the said flora, as known at the time of writing (1898), to comprise 867 species of Phanerogams and vascular Cryptogams, and further estimated that at least 1100 or 1200 species would eventually be found within the area in question. It may be of some interest to ascertain what support to this opinion recent investigations have yielded: for this purpose the narrow coastal strip forming the Eyre district must naturally be excluded. The labours of Drs. Diels and Pritzel, then, supplemented by those of their correspondents already mentioned, have added sixty-six new species to this part of the island-continent; and when to these are further added the species recently described in this country, those published under the auspices of the Mueller Botanical Society of Perth, and finally a few not new which have been found to extend their range into the interior—some seventy in all, we must conclude that about one thousand species already represent the flora of the West Australian interior. When, further, we bear in mind the large stretches of country about which virtually nothing is known, it would appear that the estimate given above, so far from being exaggerated, is really below the mark, and perhaps very much so.

There are some curious omissions. Thus of *Solanaceæ* the only genus mentioned is *Anthotroche* (*Duboisia*, &c., are considered as belonging to *Scrophulariaceæ*). The curious dwarf forms of *Nicotiana suaveolens* Lehm. were not met with, and one is surprised to see no reference to the Solanums, plants invariably found by me at the "gnamma" rocks so frequent in the country. *Asclepiadeæ* have no place at all in the memoir, and, though there are but few of them, the omission is certainly curious. One at least, viz., *Marsdenia*

Leichardtiana F. Muell., the authors could scarcely have failed to encounter. I saw plenty of specimens in the Mount Margaret district, one of the localities, Kilkenny "soak," being but a few miles distant from Menzies. This plant—it is a twiner—is likely to attract the botanist's notice from its singular habit of continuing to flower after the lower portion has been absolutely destroyed by drought. The authors appear also to have missed seeing the lovely herbaceous vegetation of early spring in the desert. A noteworthy feature of this is the number of exceedingly small plants which flourish at this period. So numerous and so closely associated are these that on several occasions, on pulling up a handful of such plants apparently comprising only one or two species, I was surprised to find that I had secured half a dozen or even more. In this connection many novelties are still likely to reward anyone who will lay himself out for this particular line of search.

But, criticism aside, one can only marvel how so much work, of such good quality too, could have been crammed into the few months at the authors' disposal. Undoubtedly this memoir deserves to become a classic, which every would-be botanical explorer should diligently study and imitate as far as in him lies. Drs. Diels and Pritzel and their coadjutors are heartily to be congratulated on enriching our science with what assuredly is by far the most important contribution to the Australian flora that has appeared since Bentham brought his great work to its close, and Mueller, whose name will live for ever in this connection, was forced to lay aside his eager and enthusiastic pen.

S. M.

BOOK-NOTES, NEWS, &c.

The death of Don Juan Joaquin Rodriguez y Femenias, the veteran botanist of Mahón, occurred on the 8th of August at Barcelona. As far back as 1868 Señor Rodriguez issued a *Catalogo razonado de las plantas vasculares de Menorca*, containing, with a supplement published at Madrid in 1874, 858 plants, eight of which were new to science. This work described the physical geography of Minorca, its geology and climate, and gave an account of the chief agricultural and economic features of the island vegetation. In after years the author discovered and described, in the *Bulletin de la Société botanique de France*, several other endemic species, including the beautiful *Ervum bifoliatum* and *Lysimachia minoricensis*. The closing decade of his life was mainly devoted to the study of marine algæ on the Minorcan coast, and resulted in the description of a large number of new Mediterranean seaweeds. An up-to-date *Florula* of the island is left almost complete. Species of the genera *Sagina*, *Senecio*, *Mentha*, and *Micromeria* bear the name *Rodriguezii*. Señor Rodriguez was a genial, courteous gentleman, who will be held in kindly remembrance by those travellers who made his acquaintance and received his help.—Jas. W. White.

The *Transactions of the British Mycological Society* for 1904 testify to the continued activity and zeal of the members. A fungus foray was held at Whitby in the early part of September, and an account of that and of the plants gathered has been prepared by the Honorary Secretary, Mr. Carleton Rea. Dr. Plowright contributes a summary and criticism of Eriksson's mycoplasma theory. He thinks that inherited mycoplasma might explain much that is mysterious in the seemingly inexplicable outbreaks of plant disease, but he withholds acceptance of the theory until further proof is produced. Dr. Plowright also publishes an account of a new Chrysanthemum disease, due to a fungus, *Peniophora Chrysanthemi*, n. sp. Other contributions include papers by R. H. Biffen and C. H. S. Percival. The annual list of fungi new to Britain, and in several instances new to science, is an indispensable part of such a publication. They form a substantial addition to our constantly increasing fungus-flora. The Transactions are illustrated by four coloured plates reproduced from water-colour drawings by Mrs. Carleton Rea, a member of the Society.—A. L. S.

The first part—vol. 22, part 1—of a new and important *North American Flora* has been issued for the New York Botanical Garden. It is "designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçoa and other islands off the north coast of Venezuela, whose flora is essentially South American." A committee of two—Dr. Britton and Dr. Underwood—has been appointed to prepare the work, with an advisory committee, on which we regret not to see the name of the sure and sound worker Dr. B. L. Robinson. The work will be in thirty volumes: i. Mycetozoa, Schizophyta, Diatomaceæ; ii.–x. Fungi; xi.–xiii. Algæ; xiv., xv. Bryophyta; xvi. Pteridophyta and Gymnospermæ; xvii.–xix. Monocotyledones; xx.–xxx. Dicotyledones. The present instalment contains *Podostemmaceæ* by G. V. Nash; *Crassulaceæ* by N. L. Britton & J. N. Rose; *Penthomaceæ* and *Parnassiaceæ* by P. A. Rydberg; it will thus be seen that the work is largely in the hands of those who, rightly or wrongly, have been conspicuous in splitting up the larger genera and species. The citations are made in accordance with the rules laid down for American use; to our mind, the usual mode of indicating volumes by Roman numerals and pages in Arabic is far more convenient than the new plan by which each is in Arabic, the volume being indicated by a somewhat thicker font. In like manner, the usual method of citing papers contributed to magazines—"Rose *in* Bull. N. Y. Bot. Gard.," &c., is preferable to the plan here followed of omitting "in." The "type locality" for each species is given; this, when detailed—"Grant's Springs, Mariposa County, California"—is useful, but what is gained by citations so wide as "Europe," or so doubtful as "Mexico"?

Mr. J. Medley Wood, of the Durban Botanic Gardens, continues to issue his figures and descriptions of *Natal Plants*, of which the

third part of vol. iv. has reached us. Useful as the work is, we cannot help regretting that more care is not taken both with the letterpress and the illustrations. The drawings are exceedingly rough and badly arranged, and hardly ever suggest the habit of a living plant; no indication is given of the extent to which the details are enlarged; and the lithographing is of the coarsest kind. The text, too, is full of slight but irritating errors which might be obviated by a very little care; for example, the sign of abbreviation is usually omitted from such names as "E. Mey," "Hook," "Burch"; we get such phrases as "Sub. S[opubia] Simplex"; such careless references as "Eng. Bot. Jahr., p. 34." There is also an absence of original descriptions where they might be expected—*e. g.*, the account of *Ceratotheca triloba*, described as "common in the coast and midland districts," is "copied verbatim from the Botanical Magazine." We cannot feel that Mr. Wood has made the most of his opportunities.

The costly and cumbrous *Illustrationes Plantarum Europæ Rariorum*, by M. G. Rouy, has come to an end with its twentieth fascicle. The work, which began in 1895, contains 500 plates, reproduced in photography from "des exemplaires existant dans les grandes collections botaniques et notamment dans l'Herbier Rouy." Unfortunately the examples cited are in many instances not those on which the species was founded, but those which represent it in "Herb. Rouy" and no doubt in the author's *Flore de France*; thus the plates of *Centaurea hybrida* All., *Bellium minutum* L., and the like, can hardly be regarded as typical of what their authors intended, although doubtless in all such cases due care has been taken in naming. We think it should have been possible to have added dissections in the case of critical species, and that good drawings including these details would have been more useful and less costly than the mounted photographs, and would certainly have been more convenient for reference. The text does not indicate from which locality, when, as often, more than one is given, the specimen figured was taken; and there is no general index arranged under orders, which would have been useful, as each fascicle is independently arranged.

The concluding part of the *Flora der Schweiz*, by Prof. Schinz and Dr. Keller (Ranstein, Zürich: price 6 marks), of which the first instalment was noticed on p. 192, contains the "Kritische Flora" of the country, and is evidently done with much care. Just over a third of the book, the descriptive portion of which occupies 349 pages, is devoted to *Hieracium*—a genus which will soon become entirely unworkable through its excessive elaboration; *Rosa* has thirteen pages, *Rubus* ten. *Alchemilla*, in which Prof. Buser is mainly followed, has more than seven pages; we note that *A. vulgaris* as a species seems to have disappeared, but the name can hardly be allowed to drop out altogether. There is an excellent general index to the two volumes, which is so arranged as to render conspicuous the very large number of varieties described in the work.

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JAMES BRITTEN, K.S.G., F.L.S.

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Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

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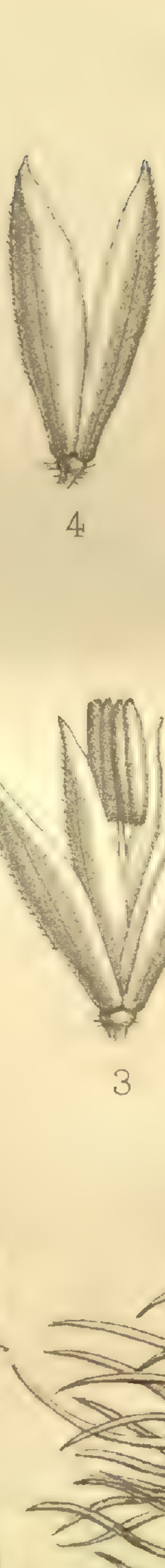

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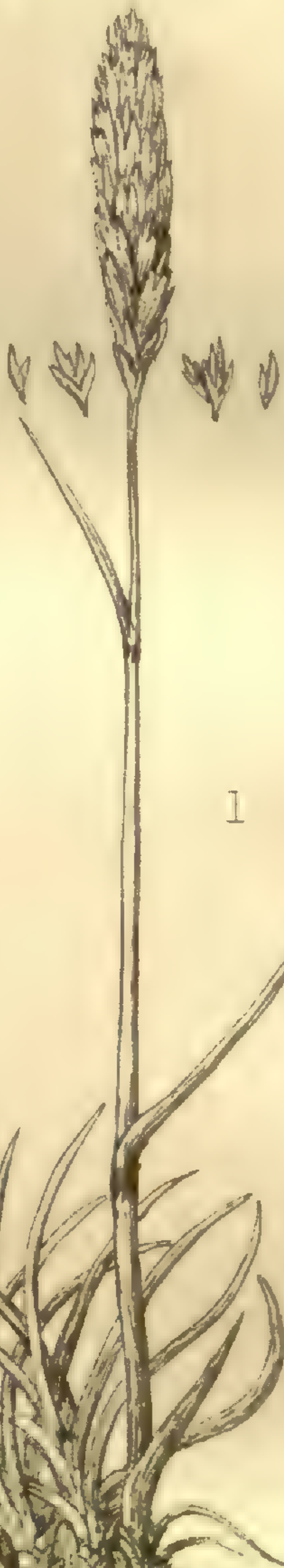

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Koeleria splendens *Druce.*

KŒLERIA SPLENDENS AS A BRITISH PLANT.

By G. Claridge Druce, M.A., F.L.S.

(Plate 474.)

The history of this species as a British plant is somewhat remarkable. During my preparation of a History of the Dillenian Herbarium at Oxford, which is now being printed by the Clarendon Press, I found a number of plants which Dillenius had preserved, evidently with the intention of preparing another edition of Ray's *Synopsis*, or as an appendix to the third edition which he had edited in 1724. Among these were three specimens of a *Kœleria*, which, on examination, I saw was not *K. cristata*, and I thought must be referred to *K. valesiaca*. There was no label, but subsequent investigation convinced me that a loose label which had been put in another cover with a scrap of *Festuca* belonged to them. This runs as follows :—

"*Spartum montanum, radice bulbosâ et fungosâ.* Peculiaris quæ præ aliis graminibus radix huic obtigit, denominandi nobis rationem suppeditavit. Est enim ea non tantum pro graminis ratione satis crassa, sed et multiplex et veluti bulbosa, substantia molli et fungosa, coloris interne subalbidi, externe rubiginosi, quam tincturam a soli natura, quod lutum rufum est, ipsi contingere arbitror, ut ea aliis plantis in eadem terra ibidem nascentibus non æque adhærent.

"Licet autem radix tam crassa sit, non plures tamen quam unum eodem anno emittit culmum, eumque non e medio, vel quacumque ipsius parte, sed plerumque ex alterutro saltem latere. Altitudinem iis adipiscitur modo palmarem, modo dodrantalem, duobus plerumque vel tribus geniculis; si id quod ad radicem proxime situm et minus conspicuum est, connumeres, interceptum et spica terminatum uncialis aut paulo longioris longitudinis, e pluribus locustis conjunctis 2, 3, 4-ve in eodem perbrevi pediculo hærentibus constructa, quæ singula e duabus componuntur glumis communibus, duas etiam claudentibus locustas partiales, quibus singulis totidem sunt glumæ propriæ, quot sunt communes, altera brevior altera longior aliquantum, et muticæ omnes et nulla arista terminatæ. Quo tempore reperiebam, reperi autem Julii medio, gramen hoc grana vel jam dimiserat vel nulla protulerat, locustæ enim erant cassæ, et spica caulisve gramineum colorem induerant, folia, autem quæ e radicum capitibus plura enascentia habet, vivebant et egregie glaucæ erant. Hæc quidem folia gracilia sunt, convoluta ac veluti juncea reflexaque, at quæ in caule locantur recta extant, latiuscula et aliquanto breviora, si ab ea parte, qua a caule abcedunt, calculum ineas; nam reliqua parte ad unam alteramve unciam a geniculo ad geniculum caulem vaginæ instar cingunt. Utraque sunt lævia, duriuscula, parte interne, striata. Radice, ut dictum, nititur sat crassa, in multa capita divisa, parte inferiore multas fibras emittente. Nascitur satis copiose super rupes ad radices montis vico *Uphill* imminentis, una cum *Peucedano minor* [*Apinella glauca*], in altero illo monte *Brentdown* vocato, qui e

regione situs est in mari, unde conjicias marino adflatu delectari hoc gramen.

"*Spartum vulgarè Oceanicum pungens* [*Ammophila arundinacea*] similem habet spicam et similes locustas in eodem pediculo plures, nisi quod folliculus simplex sit, et ad basin papposus, quo non obstante ob reliquam partium similitudinem, et totum habitum *Sparti* speciem judico hoc gramen. A J. Scheuchzero Agr. p. 169, n. 4, describi existimo titulo *Gramini valesiani tenuifolii, paniculâ spicatâ, viridi-argenteâ splendente*. Specimen quod in *Phytoph.* suo servat *D. Sherard*, simile est nostro, spica et culmo, sed majus, et radice destitutum; cujus etiam descriptionem amisit Scheuchzer quia ipse nascens non vidit sed a fratre habuit. Olim paniculano tribui huic gramini ut communi sparto. *Angustifolium* medius dixisset Sch. quam *tenuifolium*, nec splendens adeo est locusta (externa præcipue), ut nivea denominationem mereat. Lanugo folliculorum quam tribuit Sch. vix conspicua nudis oculis."

A reference to Dillenius's diary of his journey into Wales in 1726 shows that the plant was found on Uphill on July 16 of that year; see also Richardson's *Correspondence*, 253.*

The specimen which I sent to Prof. Hackel was pronounced by him to be *Kœleria valesiaca*. My identification was not made until October last year; but late as it was in the season, I went down on Oct. 16 to the Uphill habitat, and within a quarter of an hour I succeeded in finding some flowerless specimens growing in the turf to the south of the church, and eventually saw it in plenty on the steep limestone terraces near the great quarry which faces the sea; in this place the dead spikes were still attached to the plant, and put its identification beyond dispute. It is a distinctly xerophilous species, and its handsome foliage, with the thrift-like leaves, quickly enroll on drying. It grows on the carboniferous limestone, and prefers the very edge of the rock-ledges, towards which it creeps, and its rootstock may be seen an inch or two beyond the soil, protected by the curious fibro-vascular bundles of the decayed leaves, which persist for long periods. Here it was associated with the other plant mentioned by Dillenius, namely, *Apinella glauca*, which is still abundant. The *Kœleria* not only occurs here, but I traced it on to another series of limestone ledges to the south. It is abundant over at least a mile of Brean Down, where the soil is a reddish earth above the carboniferous limestone, as well as in similar situations to the one at Uphill. In June, 1905, I visited the locality in order to gather the plant in flower, and found it in great plenty; Mr. J. Walter White also saw it this year in abundance on Worle Hill in several spots north of Uphill; and Mr. Cedric Bucknall reports it from Crook's Peak, seven miles to the south-west, sparingly on the upper part of the hill, where most of the plants were barren, and more plentifully on the lower southern slopes.

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* [There is in the National Herbarium a specimen from Brean Down sent to Shuttleworth by Sir J. D. Hooker in 1837; to this Dr. Domin, who has lately been engaged in a revision of the species, has attached a note—"*Koel. Vallesiana* (All.), forma culmo pubescenti ad var. *alpicolam* spectans."—Ed. Journ. Bot.]

The plants of St. Vincent's Rocks, Berry Head, and Babbicombe which I collected are, however, all *K. gracilis*; plants from the locality have been named *K. gracilis* var. *gypsacea* by Dr. Domin. Although evidently preferring full sun and wind exposure, and disliking the proximity of other grasses, yet it often grows with *Thymus Chamædrys* (as in France) and *Apinella*, and associated occasionally with *Avena pubescens*. When growing under the partial shelter of a protruding cliff, or hawthorn-bushes, it grew in greater luxuriance, some of the culms being eighteen inches high, and flowered freely. On the upper Downs the specimens were often barren; but this may have been partly owing to sheep grazing, or the exposure to traffic of passers-by, and possibly in part from its being unable to bear the competition of *Poa pratensis* and other grasses.

The continental distribution, as given by Nyman in the *Conspectus*, for *K. asetacea* is "Hisp. Pyr. Gall. mer. occ. etc. Ligur. Pedem. Parm."; and for *K. valesiaca* Gaud. (which is put with *K. setacea* Pers.) "Hisp. Pyren. Arvern. Delph. etc. Helv. Tirol." In France it extends along the western shore up to the Loire, so that its geographical range would lead us to expect it might occur in south-western England or Ireland. It adds another to that interesting group of species which comprise *Cephalanthera rubra*, *Stachys alpina*, *Arabis stricta*, *Apinella*, *Campanula persicæfolia*, *Dianthus gratianopolitanus*, *Draba aizoides*, and *Helianthemum polifolium*, which are confined to the south-west of Britain.

The British plant, although distinctly included in the aggregate species, does not exactly answer to either of the varieties described by Grenier and Godson in *Flore de France*, but Dr. Domin names it var. *glabra* of those authors. The following is a description of our British form:—

Rootstock shortly creeping, close, often forming very hard tufts, attaining a considerable age, and covered with remains of the fibro-vascular bundles of the leaves, which form a roughish, netted, membranous covering to the rootstock, which is whitish within, but with the netted covering occasionally of a rufous colouring, from the reddish soil in which it sometimes grows; when, as is not unusual, the bare rootstock grows on the extremity of a limestone ledge, it becomes of a greyish hue, and the interior, in old specimens, is not rarely penetrated with a mycelium. Stem 3–18 inches high, erect; or the external ones of each tuft sharply ascending; thin, smooth, glabrous below, more or less clothed with soft, close pubescence immediately beneath the panicle or even from above the middle of the culm. Leaves with bald, smooth sheath, which is striate when dry; lamina of basal leaves narrow, rather rigid, mostly convolute, and closely enrolled when dry, with 4–5 conspicuous strands, glabrous. In the fresh state they much resemble the narrow-leaved form of the sea thrift. Lamina of the stem-leaves usually shorter, broader, strongly striate within, with 5–6 prominent strands, slightly ciliate on the margin of the lamina, less striate beneath, and less convolute than that on the lower leaves. Ligule short, sometimes almost obsolete, truncate, toothed. Panicle $\frac{3}{4}$ to $2\frac{3}{4}$ inches long, close, sometimes laxer at the base, but more com-

pact than that of *K. cristata*. Spikelets 2–4-flowered, shorter than in *K. cristata*. Glumes almost of same length, as long as the flowers, or in the lower hardly so long, pointed, and slightly ciliate on the keel. Lower pale, bluntly or shortly acuminate, with white shining scarious margin; upper pale, membranous, terminated at the narrowed point in two unequal, rather long, narrow, pointed teeth. Anthers usually purplish, rarely yellow.

Ascherson & Graebner, in *Synopsis der Mitt. Europaischen Flora*, ii. p. 354, put our plant (under the name *K. vallesiana*) in the section of *Kœleria*—A. *Ærochloa*, subsection i., which is distinguished by the characters: "Leaf-sheath parting finally into fine web-like threads woven in coils, surrounding the rootstock with a compact soft web. Panicle close"; whereas *K. cristata* is put in subsection ii.: "Leaf-sheath undivided or finally separating into coarse, stiff, not interwoven fibres. Panicle usually somewhat interrupted at base." In addition to these characters the glaucous green of the leaves with more rigid foliage, the glabrous leaf-sheath, the more convolute leaves, offer means of identification.

Our British specimens differ from the type only in the pubescence of the culm, which Gaudin does not mention, but which occurs in Swiss specimens from the Jura (not from Wallis), but the character is not a constant or important variation, although sometimes giving a different aspect to the plant. Prof. Hackel tells me that such a form is described by Timbal-Lagrave in *Bull. Soc. Bot. France*, xi. 139, 1864, under the name *K. setacea* var. *intermedia*, from the Pyrenees, whence Prof. Hackel has a specimen from Gèdres, agreeing well with the Somersetshire plant I sent him.

Dr. Domin has recently examined further material from Uphill, and identifies some with the var. *glabra* and some as the var. *alpicola* Gren. & Godr., but not typical. They are the *intermedia* of Timb.-Lag., itself a form of var. *alpicola*.

The synonymy of our plant is as follows:—

KŒLERIA SPLENDENS.

Gramen valesianum, tenuifolium, paniculâ spicatâ, viridi-argenteâ, splendente: J. Scheuchzer *Agrostographia*, 169 (1719).

Spicâ Sparti, foliis reflexis angustis glaucis striatis, radice crassâ et fungosâ: Dillenius in litt. to Richardson, Oct. 8, 1726; Richardson *Correspondence*, 253 (1835).

Spartium montanum, radice bulbosa et fungosa: Dillenius MS. in Herb. Oxon.*

Festuca splendens Pourret in Act. Mem. Acad. Toul. iii. 379 (1788).

Aira valesiana All. auct. 40 (1789).

A. vallesiaca Sut. Fl. Helv. i. 40 (1802).

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* [In connection with this it is interesting to note that in a small collection of engravings in the National Herbarium, which were formerly in Herb. Banks, and are labelled "Found among Dillenius's papers," is an excellent figure of the plant (reproduced on Plate 474) lettered *Spartium montanum, radice bulbosa, fungosa*, doubtless intended, as Mr. Druce suggests, for another edition of Ray's *Synopsis*.—ED. JOURN. BOT.]

Poa pectinata Lamarck, Ill. i. 183 (1791).
Kœleria tuberosa Pers. Syn. i. 97 (1805); Lois. Fl. Gall. i. 66 (1806–7).
K. valesiaca Gaud. Agrost. Helv. 149 (1811); DC. Hort. Monsp. 117 (1813).
K. setacea DC. Hort. Monsp. 117 (1813); Gren. & Godr. Fl. France, iii. 527; Nyman, Consp. 816, Suppl. 335; Richter, Pl. Europ. i. 75.
K. intricata Genty in Magn. Scrin. viii, 153 (1889) (ex Domin).
Var. *setacea* Koch, Syn. 913 (1837).
Var. *intermedia* Timb.-Lagrave in Bull. Soc. Bot. France, xi. 139 (1864).
K. Vallesiana Ascherson & Graebn. Synopsis Mitteleur. Flora, ii. 354 (1898–1902); Domin, Fragm. 5 (1904).

A word of explanation is necessary as to the use of the name *Kœleria splendens*. The recent Conference on Botanical Nomenclature at Vienna passed almost unanimously the rule which insists upon the permanence of the original trivial or specific name. This rule is already adopted by a large number of continental and American writers, and, among others, by Ascherson & Graebner, but not invariably. In fact, the name *K. vallesiana* which they use is chosen by them because it was the *Aira valesiana* Allioni, 1789; but they apparently overlooked the still earlier *Festuca splendens* Pourret, which dates from 1788, and they reject the oldest binomial in the genus *Kœleria*, i.e., *K. tuberosa* Pers., which has a wrong reference and habitat, and the undoubtedly correct *K. valesiaca* Gaudin. The Vienna rule causes me to restore Pourret's specific name. This will necessitate the substitution of another name for the Mediterranean *K. splendens* Presl, Cyp. et Gram. Sicil. 34, 1820.

EXPLANATION OF PLATE 474.

Koeleria splendens Druce. — 1. Figure prepared for Dillenius and found among his papers (see p. 316). 2. From specimen sent by Mr. Druce. 3. Spikelet. 4. Outer barren glumes. 5. Fertile glumes. 6. Upper floret. (3–6 enlarged.)

GRAHAM'S MEXICAN PLANTS.

By James Britten, F.L.S.

By the kindness of Mrs. Howgrave Graham the National Herbarium has lately become possessed of a set of the plants collected in Mexico in 1827–29 by Mr. George John Graham. Although his collection is familiar to botanists, through the *Plantæ Hartwegianæ*, so little was known of Graham himself, that in the *Biographical Index of British Botanists* (first supplement) he is said to have died "before 1839." It may be worth while, therefore, to give some information concerning him, for much of which I am indebted to Mrs. Graham.

Mr. Graham, who was born at Brampton, Cumberland, in 1803, went to Mexico in 1827, for the purpose of reporting on some mines

there. He at once began collecting both plants and seeds: the former he sent to Bentham, who described some of them in *Plantæ Hartwegianæ*, on the title-page of which his name appears, "Plantas Hartwegianus imprimis Mexicanas adjectis nonnullis Grahamianis enumerat novasque describsit Georgius Bentham." In the preface to the volume Bentham thus acknowledges Graham's help: "To [Hartweg's] plants I have occasionally added notes on another most valuable set of above 400 beautifully dried Mexican species, gathered about the town of Mexico and in the mining districts of Tlalpuxahua and real del Monte, and presented to me some years since by G. J. Graham, Esq., a gentleman whose name must be well known to horticulturists, from the number of handsome Mexican plants he was the means of introducing to this country, and whose zeal in collecting specimens, and liberality in disposing of them, equally entitle him to the gratitude of botanists." Some of these plants were figured in the periodicals of the period—e. g. *Salvia fulgens* (Bot. Reg. t. 1356), which was first known to Lindley from "a specimen that flourished in the garden of the Horticultural Society, having been raised, in 1829, from seed collected on the mountains of Mexico by — Graham, Esq., a gentleman who has enriched our gardens with several fine things, and who has formed a most interesting herbarium of Mexican mountain plants." Another of Graham's Salvias—a new species—was figured on t. 1370 of the same magazine and named by Bentham *S. Grahami*; and his name is given by Bentham to several new species described in *Plantæ Hartwegianæ*.

The collection acquired by the National Herbarium contains two hundred and sixty-six specimens, and is therefore not complete, as Bentham's MS. list received with Graham's herbarium contains four hundred and fourteen numbers. It is mostly named by Bentham, and many of the specimens have tickets giving locality and sometimes descriptive notes in Graham's hand. The set sent to Bentham is in the Kew Herbarium.

Graham was an intimate friend of John Stuart Mill, to whom he sent from Mexico a sort of diary in the form of copious letters. The two made many long tramps together in the course of forming a collection of English plants, which, however, has not been preserved. On his return to England he became an official assignee of the Court of Bankruptcy. From 1848 until his death, which took place at Ventnor on January 1, 1878, Graham resided at East Lodge, Enfield Chase: he kept up a correspondence with Mill on botanical matters, but seems to have published nothing.

A correction made by Graham in the first sheet (p. 10) of *Plantæ Hartwegianæ* may be noted. Bentham writes of *Cratægus mexicana*, "leg. cl. Graham. specimen sylvestris prope Teocote"; and this is repeated as a locality in *Biologia Centr. Amer.* i. 379—"Teocote, Graham." Graham deletes "prope" and substitutes "called by the Indians." On p. 13 (*Pl. Hartw.*), under *Inga pennatula*, "prope Tacamarna et sub monte las Organes" should read "prope Tacamaran et sub monte los Organos." Unfortunately only the first sheet is among Graham's papers, or it would probably be possible to make other corrections.

SOWERBY'S DRAWINGS OF FUNGI.

By W. G. Smith, F.L.S.

Besides the drawings for his *English Fungi* already described, the British Museum possesses certain other Sowerby drawings for *English Botany* and for Dickson's *Fasciculus Plantarum Cryptogamicarum Britanniæ*, as well as some unpublished ones to which reference has already been made (p. 157). Of these the following is an enumeration.

Drawings for "English Botany."

Tremella mesenterica Retz. Eng. Bot. t. 709. There is a carefully drawn and coloured original of this, but the central figure is nearly twice as large as that on the plate; the original is only partially coloured.

Ulocolla foliacea Bref. Eng. Bot. t. 1452. There is a careful partially coloured original.

Tremella intumescens Sm. Eng. Bot. t. 1870. There is a carefully drawn and partially coloured original of this with pencillings indicating additional growths. There are one or two notes, "new," "when dry only a thin membrane," and "on beech St. Leonards Forrest in a very wet state."

Exidia albida Bref. Eng. Bot. t. 2117. The original consists of rough uncoloured pencil sketches with three or four times the material of the plate, but without the section and spore groups. There is one note, "scarce any coat on this, substance like boiled starch but whiter."

Tremella moriformis Berk. Eng. Bot. t. 2446. There is a carefully drawn and coloured original.

Hirneola Auricula-Judæ Berk. Eng. Bot. t. 2447. There is a careful, partially coloured original with one note, "Should not an older or blacker bit be added."

Exidia glandulosa Fr. Eng. Bot. t. 2448. The original is partly coloured, and there are pencillings of other examples on the sheet.

Tremella vesicaria Bull. Eng. Bot. t. 2451. There is a carefully drawn, partially coloured original with one note, "2452 is your new black T. flaccida."

Exidia glandulosa Fr. Eng. Bot. t. 2452. This is a second illustration of this species, see 2448; the original is a careful, partially coloured drawing. The larger group of three plants is $\frac{7}{8}$ in. longer and $\frac{1}{8}$ in. wider on the drawing: the upper right-hand figure is not like the original, and there is only a slight indication of a section. There is one note, "The wrinkled side is always described as uppermost in these specimens the plant is become pendulous from the situation, upper surface resembling black crape."

Drawings for Dickson's "Fasciculus."

Agaricus sordidus (*A. cyathiformis* Fr.). Tab. iii. f. 1. The original is named "Agaricus Scoticus Syn."—"Sowerby & Agnew." The drawing shows a third illustration placed between the two shown on the plate; the third specimen is shown as cut or broken so as to show the gills and hollow stem. The original is much darker in colour than the plate.

Boletus strobiliformis (*Strobilomyces strobilaceus* Berk.). Tab. iii. f. 2. The plate is an indifferent copy of the original, numbered 1516 and dated 1783.

Geaster coliformis Pers. Tab. iii. f. 4. There is no original of this; the plate appears to have been prepared from a dry example. This plate was engraved twice. The two differ in many minor details, the one bound in the Museum volume is signed "D. Mackenzie fec$^{t.}$"; the other, attached by the corners, is unsigned.

Boletus abietinus (*Polyporus abietinus* Fr.). Tab. ix. f. 9. The engraving only shows two fragments of a large and beautiful drawing. An enlarged section and details of spores are omitted on the plate.

Clavaria epiphylla (*Mitrula paludosa* Fr.). Tab. ix. f. 10. This is one group only, selected from three, with the section omitted. The original is coloured.

Sphæria ramosa. Tab. xxii. f. 7. Probably a form of *Hypocrea alutacea* Fr. The main branch is from one of three illustrations. The right hand, ramified branch is a portion of another figure; a third and much more important specimen is omitted on the plate. There are three enlarged perithecia and a section on the original, but only a section of one perithecium on the plate.

Sphæria pedunculata. Tab. xii. f. 8. Probably *Xylaria pedunculata* Fr. One example out of two is engraved. There are seven perithecia drawn in section and enlarged, as well as an apex of a club on the original. There is a pencil note in the Museum volume of plates, "among stubble Marchhouse, Common Field, Walthamstow."

Clavaria lignosa (*Lentinus lepideus* Fr. var. *A Curtis*).* Tab. xii. f. 9. The plate is only the upper half of one of three fine and instructive original illustrations. A note on the engraved plate in the Museum volume says, "on a door frame in a wine cellar at Hackney—several times."

Unpublished Drawings.

The notes on the drawings for *English Fungi* show the large number of supplementary drawings illustrative of Sowerby's plates which are contained in the National Herbarium. There are, in addition, many original drawings with notes, obviously drawn for publication, which have hitherto not been named, and not only

* See Journ. Bot. 1903, 322.

never engraved, but never even referred to in published books. All these drawings are incorporated in the general collection. The originals may be found under the numbers appended to these notes.

103. AGARICUS (TRICHOLOMA) SAPONACEUS Fr. A drawing of small examples, with the note, "disagreeable strong smell like Boletus squamosus."

120. AGARICUS (TRICHOLOMA) CARNEUS Bull.

154. AGARICUS (CLITOCYBE) CLAVIPES Pers. A coloured drawing of the small gregarious form as found on short heaths.

172. AGARICUS (CLITOCYBE) PHYLLOPHILUS Fr. A coloured drawing of this, but numbered 143. Plate 143 is *A. Clitopilus prunulus* Scop., named by Sowerby *A. pallidus*. On the back is written, "Ag$^{s.}$ cyathiformis With 285" "opacus or var of eburneus"; also "at Wanstead in the same habitat with the champignon also on Finchly com$^{n.}$"

183. AGARICUS (CLITOCYBE) FUMOSUS Pers. The drawing is inscribed, "tast like Agaricus campestris." There is a second drawing of *A. fumosus* on the back of 1392, *Marasmius peronatus* Fr.

311. AGARICUS (MYCENA) RUGOSUS Fr. A coloured drawing of this on the back of 1458, *Boletus flavus* With.

313. AGARICUS (MYCENA) GALERICULATUS Scop. There are two drawings of this slightly joined together; on one is written "well tasted," on the other "strong fœtid smell, gills fixed or loose."

386. AGARICUS (OMPHALIA) UMBELLIFERUS Linn. A coloured drawing of three groups of two, three, and seven examples, and a section.

407. AGARICUS (PLEUROTUS) CORTICATUS Fr. var. TEPHROTRICHUS Fr. A small highly finished pencil drawing, with the note "oak pile Deptford yard Oct."

449. AGARICUS (VOLVARIA) BOMBYCINUS Schaeff. A pencil outline.

454. AGARICUS (VOLVARIA) SPECIOSUS Fr. A drawing.

489. AGARICUS (ENTOLOMA) SERICELLUS Fr. A pencil sketch of four examples.

565. AGARICUS (TOGARIA) DURUS Bolt. A very good drawing, showing the characteristic root-like growths; two examples and a section, dated Nov. 22nd, 1793. There are the following notes:— "Found by a banking of clay for a resavoir on Hampstead Heath," and "watery and somewhat fœtid tast." The species is easily identified by the decurrent tooth to the gills, the appendiculate veil shown on the section, and the root-like growths at the base of the stem.

592. AGARICUS (PHOLIOTA) MUTABILIS Schaeff. Three drawings with notes.

597. AGARICUS (PHOLIOTA) MYCENOIDES Fr. A drawing.

618. AGARICUS (INOCYBE) OBSCURUS Pers. A drawing.

648. AGARICUS (HEBELOMA) FASTIBILIS Fr. A good coloured drawing.

659. Agaricus (Hebeloma) crustuliniformis Bull. The drawing has a note, "strong fœtid smell and tast likewise."

661. Agaricus (Hebeloma) longicaudus Pers. A coloured drawing of four examples, and the note, "insipid but not disagreeable."

763. Agaricus (Tubaria) furfuraceus Pers. A coloured drawing of three groups and a section.

808. Agaricus (Stropharia) squamosus Fr. A coloured drawing of five examples and a section, with the note, "tast like mushroom rather insipid."

823. Agaricus (Hypholoma) sublateritius Fr. One drawing, including partially developed examples; the word "Supplement" is on the drawing.

838. Agaricus (Hypholoma) Candollianus Fr. A partially coloured drawing of three groups and a section. A second drawing of three specimens and a section, with the note, "almost tastless, rather mushroomy," and a third drawing of a large example and section.

845. Agaricus (Hypholoma) sarcocephalus Fr. A partially coloured drawing, with the notes, "mushroom tast" and "tast mushroomlike but wooly," and the word "Supplement."

862. Agaricus (Psilocybe) semilanceatus Fr. A drawing of three examples and a section.

899. Agaricus (Panæolus) phalænarum Fr. Two coloured drawings, one in part copied from the other. A note says, "outside somewhat sooty."

1026. Cortinarius (Myxacium) grallipes Fr. A good coloured drawing of four examples and a section.

1040. Cortinarius (Inocybe) cyanites Fr. A good coloured drawing of five examples and a section; near the stem is written "very soft not ragged but smooth," and "agreeable mushroom tast."

1108. Cortinarius (Telamonia) bovinus Fr. A coloured section, with a note, "see p. 102." Plate 102 is *C.* (*Phlegmæium*) *multiformis* Fr., with a section somewhat like this drawing.

1192. Hygrophorus erubescens Fr. A drawing of three examples and a section, with the note, "not done."

1193. Hygrophorus pudorinus Fr. A coloured drawing and section, with a note, "mush$^{m.}$ tast camp$^{sts.}$"

1212. Hygrophorus virgineus Fr. A coloured drawing of thirteen small examples and a section.

1216. Hygrophorus russo-coriaceus B. & Br. A drawing of five examples, with the remarkable note, "Cedar smelling Nov. 24, 1793. Found at Finchly common by Mr. John Weston when out with me J. S." It is strange that Berkeley did not remark this early notice of his own species.

1227. Hygrophorus lætus Fr. A good drawing of five examples.

1231. Hygrophorus coccineus Fr. Two drawings, six examples coloured, two in pencil outline.

1235. Hygrophorus puniceus Fr. A large drawing of eighteen examples and a section, with a note, "stem very brittle, pileus stained often with orange with one or two lamellæ." There is a second fine coloured drawing of four examples.

1238. Hygrophorus conicus Fr. A good wholly coloured drawing of eight examples, and a second drawing of a single specimen.

1443. Panus torulosus Fr. Two good drawings, showing the two colour forms, purplish and brownish; the brownish example is noted as "too dark." There is a third uncoloured drawing.

1463. Boletus bovinus L. A large coloured drawing of four figures.

1499. Boletus luridus Fr. A large coloured section, with note, "from a yellow, turns to a greenish blue on breaking or cutting." In reference to the tubes, Sowerby says, "easily separates," and "edges of tubes when old brown"; near the pileus he has written, "eat by snails."

1505. Boletus versipellis Fr. Three drawings and a section of a small example: the largest specimen is 7⅝ in. high.

1506. Boletus scaber Fr. A finely executed drawing and section, but the section on the plate belongs to *B. rugosus*. Sowerby's description of his plate of *B. rugosus* refers to the two figures on this sheet.

1606. Polyporus umbrinus Fr. A highly finished water-colour drawing with enlarged sections.

1634. Polyporus molluscus Fr. A coloured drawing.

1930. Clavaria fastigiata Linn. A drawing of two examples numbered 253, but Sow. t. 253 represents other species of *Clavaria*, and not this.

2068. Lycoperdon gemmatum Fr. A good coloured section, and a drawing of a young plant.

REPORT OF DEPARTMENT OF BOTANY, BRITISH MUSEUM, 1904.

The additions to the collections by presentation have been:—The herbarium of Mr. Francis Blackwell Forbes, F.L.S., containing more than 4000 specimens, mostly Chinese—a collection of special importance in connection with the *Index Floræ Sinensis*, in which Mr. Forbes's plants are included; a representative series of the ferns of North-west India from the herbarium of the late Charles William Webley Hope was presented by his son, Mr. Adrian J. R. Hope. The other additions to the collections by presentation have consisted of:—22 specimens of *Najas* and *Potamogeton* from North Asia, from Dr. Litwinow; 334 phanerogams and cryptogams, 32 specimens of woods and 19 fruits, from Central Africa, collected by Dr. A. Bagshawe, from Col. Delmé Radcliffe; 57 Siberian phanerogams and 2 cryptogams, from Arthur Bennett; 5 specimens from India, from Dr. Theodore Cooke, C.I.E.; 108 phanerogams and

14 cryptogams from Nyika Plateau, from Miss M. Henderson; 35 specimens of grasses from China and 67 specimens from Liberia, from the Director, Royal Gardens, Kew; 3 specimens from Dr. C. H. Ostenfeld; 361 phanerogams and 2 calcareous algæ from India, from Major Prain; 90 phanerogams and 16 cryptogams from New South Wales, from R. T. Baker; 82 phanerogams and 22 cryptogams from Rhodesia, from F. Eyles; 3 fruiting specimens of Apocynaceæ from Tropical Africa, from Prof. Boyce; 8 specimens from South Nigeria, from Dr. Darker; 36 specimens from Miss E. F. Noel; 83 specimens from New Zealand, from J. Cosmo Melvill; 9 specimens of cultivated plants from J. O'Brien; 41 specimens from Jamaica, mainly orchids, from W. Fawcett; 19 marine algæ from Wei-hai-wei, China, from Dr. P. H. Boyden; 14 species of marine algæ from Sydney, New South Wales, from J. H. Maiden; Century 1 (edition 1) of Klotzsch's Herbarium Vivum Mycologicum and 8 of George Don's published lichens, from Mrs. K. M. Lyell; 134 marine algæ from the coast of Brittany and 2 from Grand Canary, from Miss Anna Vickers; original drawings of *Ophioglossum simplex*, from Prof. F. O. Bower; 84 vascular cryptogams from British East Africa, from R. Meinertzhagen; 25 ferns of Dominica, from the Earl of Crawford; 3 specimens and 4 microscope-preparations of mycetozoa, from Arthur Lister; 3 Californian marine algæ, from Miss E. C. Cowan.

The following additions have been made to the British Herbarium by presentation:—27 specimens from C. E. Salmon; 54 from G. C. Druce; 28 from Rev. E. F. Linton; 8 from Arthur Bennett; 82 from Rev. E. S. Marshall; 297 from C. E. Britton; 19 from Rev. H. J. Riddelsdell; 5 photographs of "Witches' Broom" from J. Saunders; 18 new or rare hepatics of Scotland from S. M. Macvicar; 5 species of prepared British fungi from C. E. Hartley Smith.

The following additions have been made by exchange of duplicates:—63 phanerogams and 12 cryptogams from Australia and Norfolk Island, from J. H. Maiden; 147 specimens from South Africa, from R. Schlechter.

The principal purchases made during the year were:—A large series of plants, comprising 5036 phanerogams and 211 vascular cryptogams, collected by Dr. Hassler in Paraguay between the years 1885 and 1902; a series of plants from Japan, Formosa, and Korea, consisting of 1475 phanerogams and 166 ferns, collected by the Abbé Urban Faurie; 2075 phanerogams and 66 cryptogams from Central China, by Father Hugh; 120 phanerogams and 35 cryptogams from California, by A. A. Heller; 1179 phanerogams and 8 cryptogams from Angola, by John Gossweiler; 25 specimens of American woods, by R. Hough; 124 phanerogams and 7 cryptogams of the Flora Polonica, by E. Woloszczak; 395 phanerogams and 23 cryptogams from Gulf States of America, by S. M. Tracy; 121 specimens "Herbarium dendrologicum," by Dr. Koehne; 200 specimens "Flora Carniolica," by A. Paulin; 592 phanerogams and 3 cryptogams from New Mexico, by O. B. Metcalfe; 400 specimens from Japan, by Takeda; 224 specimens from Servia, by Oscar Bierbach; 288 phanerogams and 13 cryptogams from Isla

de Pinos, also 201 phanerogams and 3 cryptogams from New Providence Island, by A. H. Curtiss; 250 cryptogams of Germany, Austria, and Switzerland, by Migula; 50 ascomycetous fungi, by Rehm; 100 rare microfungi, by Vestergren; 100 Bohemian mosses, by Bauer; 200 German fungi, 50 Uredineæ, and 50 Ustilagineæ, by Sydow; 20 specimens and 40 microscope-preparations of new and rare microfungi, by Miss A. L. Smith; 50 select fungi, by Otto Jaap; 9 select British lichens, by Crombie; 100 Saxon fungi, by Krieger; 50 North American marine algæ, by Collins, Holden, and Setchell; 25 rare British algæ, by Holmes; 87 species of prepared hymenomycetous fungi, by Hartley Smith; 421 ferns of China, Japan, &c., by Hope; 180 Ohio fungi, by Kellerman; 200 Italian fungi, by Saccardo; 4 large sheets of water-colour drawings of basidiomycetous and discomycetous British fungi, by W. G. Smith; 27 water-colour drawings of British lichens, by P. Highley.

BIBLIOGRAPHICAL NOTES.

XXXV.—L'Héritier's Botanical Works.

(Concluded from p. 273.)

Smith's part in the transaction was carried out with great caution. His introduction of L'Héritier to Dryander was of the briefest:

"Dear Sir
The bearer is positively Mr. L'héritier!—
witness my hand
J. E. Smith
Paris Sepr. 9. 1786."

On the 13th of the same month he wrote to Banks:—"By a letter from Broussonet you will by this time have heard of the visitor at Soho Square, & of the curious events which brought him there with such precipitation: I need not therefore repeat them. I cannot help however taking the liberty of suggesting to you some things which probably neither Broussonet nor L'heritier (if you see him) may mention. It appears to me that they hold this herbarium on a very precarious footing: &, as nobody knows what consequences the step which L'heritier has now set may have, & many other causes may concur to occasion its being given up when it returns, as it must do, to Paris, would not you think it worth while to hasten your return to town to see it? This, however, is not all. If it had continued tranquilly in L'héritier's hands, the duplicates, which are often very numerous, would after his publication have been distributed among botanists; & we should have shared them; for so he gave me to understand, no doubt knowing that those above him would not forbid it. Now, would it be improper for you to endeavour to persuade him to confide to your care such duplicates as shall be thought proper, without such a transaction being at present communicated to any mortal? & even under condition of

their being kept secret as long as he wishes? I dread horribly the whole getting into the hands of people who will never do any good with it, & who have no right to it. L'héritier thinks that when his prodromus is published, it will not be worth their asking; but I think otherwise, & apprehend every thing from disappointed envy. You may smile at my advice; but I hope you will not think it impertinent: I give it only that you may be aware of all that is going forward. L'héritier is not so apprehensive about the business as Broussonet: the latter is very uneasy: nobody else knows any thing of the matter. The plants are the finest things that can be, just like Mutis's. There are three new Mutisias, several Barnadesias, Durantas, &c. &c. I am not sure that I should not risque something desperate to keep the whole in England at present. I don't mean anything to the prejudice of those to whom y^e^ treasure belongs, but to prevent their hurting themselves by their own pusillanimity. You will weigh the whole, & are a much better judge of it than I can be."

L'Héritier's arrival in England was thus reported to Banks by Dryander, 21 Sept. 1786:—" Mr. L'Héritier came here two days ago, and going from Boulogne, he shipped for London Dombey's whole herbal, but which is not yet arrived. This operation is a true French one; as far as I could understand him (but when he first came I could not always make out what he said), the Spanish ministry have required of the French ministry to give up the collections of Dombey, which the French for some time avoided by various excuses, but at last thought fit to consent to: before their order arrived to Mr. L'Héritier, he set off from Paris with herbal and all, and is at Paris supposed to be at his seat in Picardie en vacance. He means to stay here three months, to determine and describe Dombey's plants; but I cannot say that I yet understand what he means to do with these descriptions."

To this Banks replies, 24 Sept. 1786 (Dryander Corresp.):—" L'Héritier's business is in truth a veritable French one; he means, as Smith informs me, to publish a Prodromus Floræ Peruvianæ at London, thinking that after such a manœuvre the Spaniards will consider the game as up & make no farther requisition. This, however, is a secret. L'Héritier must certainly have every assistance that the Herbarium or library can give him. As he stays three months I shall be up at least half the time he is here. I write to him by this to offer him all civilities & regret my absence."

A week later Banks writes to Dryander:—" I have a letter from L'Héritier which alarms me a good deal. I have from it conceived the opinion that of all the impudent Frenchmen in the whole world he is the most impertinent & dangerous. He begins with telling me that he has used my name in importing Dombey's herbarium & tried at least to do the same in passing it through the Custom House. He next asks my leave to publish a monograph of my Gerania & ends by telling me that the gift of the Genera which were intended for him is a *charité bien placée*. I have written him a cool answer & desired him to return the Genera which be so good as to send down to me here taking notice before you send them whether he

has faithfully returned the whole he received, if a man does one thing not quite in the true square of sight we have a right to suspect the rest of his conduct; if I am wrong in doing so you will be so good as to set me right.

"Among other things which displease me in his conduct is that I know & I dare say he does, that Cavanilles is about a monographie of Gerania. Be so good if I am right, to keep him at as good a distance as you can & limit his visits to the Library to the times when you are there & not fail to look out after specimens which are very scarce. I hope I am wrong in suspecting so much, but I have written in the same stile Dr. Blagden & desird him to consult with you on the subject . . . If Swartz is manageable you may possibly persuade him to delay the opening of his herbarium till I arrive. I should think it an acceptable compliment as probably if he does it sooner L'Héritier will get the most of his plants before I see them. I do not want L'Héritier to employ Curtis's draughtsman, he has orders to draw for me whenever he is not employed for Curtis." This was James Sowerby, who at this period was drawing plates for Curtis's *Botanical Magazine*.

Enclosed with this was a letter to L'Héritier of so severe a nature that both Dryander and Dr. Blagden (whose letters are in the Banks correspondence) suggest a more modified expression of Banks's views with regard to the use of his herbarium, and this was duly delivered; after which L'Héritier, with certain restrictions, had access to the Banksian collections.

A year later (27 Sept. 1787) Dryander writes to Banks:— "L'Héritier is still here; but he says he must necessarily be in Paris about the middle of November; if possible he will wait for Smith's coming back, that he may see the Geraniums in Linnæus's herbarium. He is now hard at work on this genus; and, from his manner of going to work, I don't doubt that he will really give a good monography. The first figure of a Geranium he has been able to trace is in Brunfelsius, 1532, and the first Cape Geranium mentioned is the *triste* in Cornuti, 1635."

Banks's opinion of L'Héritier, however, remained unfavourable, as is shown by the following letter from Smith; both seem to have been somewhat jealous of the use made by L'Héritier of his opportunities, although Smith fully estimated the value of his work.* Writing from Paris (5 Oct. 1787), Smith says:—

"I cannot sufficiently thank you for your very kind letter & hint about L'Héritier. Am sorry you have so much reason to think ill of him. I shall have much to say to you when we meet about the botanical party-work of this town, which I do not like at all. Broussonet, although one of the best fellows in the world, & the most friendly to me in particular, is too much engaged in these intrigues. He is quite attached to L'Héritier & I believe has no

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* "Among the Linnæan Botanists, Mr. L'Héritier is eminently distinguished by his most superb and scientific publications, the plates of which are executed with a degree of accuracy rarely to be met with, nor are the descriptions less complete" (Smith, Correspondence, i. 331).

doubt of his honour & merit, insomuch that I dare not hint anything like jealousy to him, nor give any signs of backwardness to shew L'Hr. my collection. I have accordingly (in answer to his enquiry by Brousst. about my return) told him that I shall be here about a month, & will return to London; but I mean to give him to understand that I want to go to Norwich directly, as is really the case, & that I shall only stay a very few days at Chelsea, & those few *merely* to shew him my herbarium; thus, he cannot see enough to do me harm, & will see all that I ought to shew him; for I would not be the first to shew jealousy, nor even to act ungenerously although in secret. At present I am well with everybody here, & have great reason to be pleased with my reception. Des Fontaines & Thouin are the men I most rely on & esteem, I mean after Broussonet. The latter (Broussonet) has procured me access to Tournefort's & Vaillaint's Herbariums; & I have described 80 or 90 plants for them, quite new, to enrich the Syst. Vegetabilium, about an edition of which I mean to consult with you: every body wants it, & all promise me their help. Nobody can do it without Linnæus's Herbm. I don't like L'Héritier's describing so many of our plants, because I keep the intended Linnæan Society always in view. I wish Salisbury would publish the figures for which he has got drawgs. made, else L'Héritier will supersede him; for he has drawn many of the same plants, as your *Kalmia glauca*, &c. Pray urge Salisbury a little; a word of encouragement from you will I know have great influence. Broussonet has pretty well satisfied me that L'Héritier really could not at present give away any of Dombey's specimens; they not being yet his property: hereafter we ought to expect something from him; & he has promised me both for your Herbarium & my own."

This final promise was duly carried out, for, though the whole collection is now in the Muséum d'Histoire naturelle at Paris, the duplicates given to Banks are in the National Herbarium.

Possibly the receipt of these duplicates had some weight with Sir Joseph, for the following year (29 April, 1788) he writes to L'Héritier :—"We have a project here which I fancy will be speedily put into execution, to publish the Plants as they flower at Kew in Numbers, which mode we prefer to any other; as, by that means, the publication will go on as long as it succeeds, and consequently an opportunity remains of inserting new things very soon after their first appearance. As I wish every possible success to your Fasciculi, I mean to conduct it with every possible attention to you; and as you, in your stay here last summer, took drawings of most of our best Plants, to interfere as little as is in my power with your publication of them. As the work is intended to be ultimately compleat, we shall be obliged probably some time or other to publish many of those you have got; but we may as we mean as seldom as possible to delay our figure of a plant till a considerable time after you have published yours; provided you do not delay too long, that is for several years, your publication of them. To enable me to manage this I must request you to put me in possession of a list of your drawings made in the English Gardens,

that I may not inadvertently interfere with you. We have most noble supplies from the Cape, among them Rhexia* alive, & likely to flower this year. We have also a new Fuchsia from Brasil now in flower. Your countrymen have loaded a ship of 300 Tons with Plants from the Emperor: they are stored in chests between decks, & on the deck about 400 chests containing large plants, among which are the finer species from L'Isle de France: they are probably at this time about The Streights mouth, bound for Trieste."

The "project" referred to was the "Delineations of Exotick Plants cultivated in the Royal Garden at Kew," by Francis Bauer (1796–1803), of which some account is given in this Journal for 1899, p. 181; the dedication and preface are by Banks.

The above was acknowledged by L'Héritier in a letter to Dryander dated 14 May, 1788: "Je repondrai incessament à la derniere lettre de M. Banks, à qui vous pouvez dire que les nouvelles qu'il m'a écrites me sont des plus agréables."

From this date till Sept. 1790 L'Héritier corresponded frequently and cordially, largely about his works, giving details which, as already shown, Dryander worked into the *Hortus Kewensis*.

James Britten.
B. B. Woodward.

FRASER'S CATALOGUE, 1796.

In this Journal for 1899, pp. 485–7, we reprinted one of the Catalogues issued by John Fraser, the nurseryman of Chelsea. The reasons for so doing were set forth at some length in the introduction to the paper, and it is unnecessary to repeat them. Another list has been found among the documents of the Department of Botany, and, although not of importance, may be printed as a companion to the previous one; this was itself republished as a pendant to the list written by Nuttall for Fraser which was published in *Pittonia*, ii. 116–119 (1890), by Professor E. L. Greene.

The list reprinted in 1899 is not dated; internal evidence suggests that it was issued on Fraser's return from his fourth journey, which took place in 1790. The one now reprinted stands second in chronological order, coming between the preceding and the one issued by Fraser's sons in 1811 and reprinted by Prof. Greene. The date of the fourth journey is definitely ascertained from a MS. note on our copy of the plate of *Thalia dealbata* by James Sowerby, published by Fraser in 1794, which runs:—"Discover'd growing in a Lake in North America, in the Year 1790, by John Fraser, Sloane Square, Chelsea." The general recognition of this excellent plate as a publication of the name is of interest, as it was issued without any kind of description.

The present list is reprinted *verbatim et literatim*.

* The transcriber had written "Rhetzia," which was subsequently corrected to *Rhexia*, but the plant meant was of course *Retzia*—*Rhexia* does not occur at the Cape.

JOHN FRASER,
NURSERY AND SEEDSMAN,
SLOANE SQUARE, CHELSEA.

April 8, 1796.

J. FRASER begs leave to inform the public that he has completed his fifth voyage from America; and has procured the following Plants and Seeds, which he intends to dispose of at very moderate prices. He and his brother having purchased a plantation near Charleston, South Carolina; they propose to supply this and the neighbouring European countries annually with American Plants and Seeds. Any orders addressed to John and James Fraser, Planters, Charleston, South Carolina; or to J. Fraser, Sloane Square, Chelsea, will be duly executed. He has on this as on all former occasions procured new Plants which he is convinced will enrich any Botanical Collection in Europe.

No.
1 Andromeda Arborea
2 ——— Nova Genera
3 ——— Nova
4 ——— Ferruginea
5 ——— Racemosa
6 ——— Mariana
7 ——— Nitida
8 ——— Catesbœa
9 ——— Paniculata [virens
10 ——— Arborea Semper-
11 Azalea Coccinea
12 ——— Flava
13 Bignonia Nova
14 ——— Unguis Cati
15 Annona
16 Two new Species of Convolvulus
17 China Arborvita
18 Croton Maritimum
19 Cupressus Disticha [tas
20 Five distinct Species of Cucurbi-
21 Calycanthus Florida
22 Two new Species of Dolichus
23 Esclepius Tuberosus
24 Fraxinus Nova
25 Guinea Grass

No.
26 Glycine
27 Gleditsia Monosperma
28 Hibiscus
29 ——— Coccinea Nova
30 Hammamelis
31 Illicium Flavum Nova
32 Ilex Deciduous Dahoon and other Varieties
33 Juniperus Virginica
34 Kalmia Nova, the handsomest of that beautiful Genus
35 Kuhniæ Affinis
36 Laurus Borbonia
37 ——— Æstivalis
38 Mimosa Perannual
39 Olea Americana
40 Persimon Plum [virens
41 Quercus Silex folia, semper-
42 Rhixia Nova, two other Sorts
43 Rhamnus Volubrus
44 Real Black Walnut
45 Rough Rice and all kinds of Bird Seeds
46 Smilax Herbacea
47 Walteriana

(2)

PLANTS.

Magnolia Fraseri
A new Species of Kalmia
Rhododendron Aureum
——— Punctatum
Illicium Flavum
Walteriana, a beautiful evergreen Shrub, a new Genus, called after Mr. Walter, not in the possession of any other person but J. Fraser
Kalmia Hirsuta
Dionæa Muscipula
Spigelia Marilandica
Bractearia Tomentosa
Thalia Dealbata
Borassus Hystrix
Hypoxis Juncea
Olea Americana
Hopea Tinctoria
A beautiful new Species of Orchis
Sarracenia Flava
——— Rubra
——— Lutea
——— Purpurea
Laurus Melissæfolia
Hydrangea Radiata
Phlox Subulata

Phlox Pilosa
Pyrola Maculata
Vaccineum Novum
Azamea Pumila
Agave Virginica
Andromeda Catesbœa
Gnaphalium Undulatum
Aster Concolor
Uniola Paniculata
——— Spicata
Borassus Bellifera
Gordonia Lasianthus
A new Genus, not known
Clamatis Virginica
A new Iris
Azalea Coccinea
——— Flava
Pancretium Carolinianum
A great variety of Herbaceous Plants, new
Limidorum Tuberosa of Linnæus

N.B.—A Discount will be allowed to Nurserymen.

J. FRASER has also brought over with him a quantity of New Rice, and several other American Productions.

SHORT NOTES.

HYDROLEA GLABRA.—In Journ. Linn. Soc. xi. 271 (1871), Mr. A. W. Bennett described a plant which had previously been published by Choisy as *Hydrolea glabra*—a name which he rejected on account of its previous application to another species by Schumacher, substituting for it the new name *H. elegans*. The plant had, however, already been published as *H. glabra* by Smith in Rees's Cyclop. xxi., where he points out that *Lycium capsulare* L. is to be referred to *Hydrolea:* his words run "[*Lycium*] *capsulare* of Sp. Pl. 278, appears, by the Linnæan herbarium, to be a nondescript species of *Hydrolea* called *glabra* in the Banksian collection, where is the other half of the very same specimen of which a part was sent to Linnæus by Miller, who received it from New Spain."

Its synonymy would seem to be

H. GLABRA [Herb. Banks ex] Smith in Rees's Cyclop. xxi. (1812); Choisy, Descr. Hydrol. 16 and in DC. Prodr. x. 181.
Lycium capsulare L. Cent. ii. no. 127; Amœn. Acad. iv. 308 (1759).
H. elegans A. W. Benn. in Journ. Linn. Soc. xi. 271 (1871).

The other species referred to would stand as

H. GUINEENSIS Chois. in Ann. Sc. Nat. 2 sér. i. 180 (1834), and in DC. Prodr. x. 180.
H. glabra Schumacher, Beskr. Guin. Pl. 161 (1828); A. W. Benn. in Journ. Linn. Soc. xi. 273; non Smith.

Mr. Bennett seems to have overlooked the note in Ann. Sc. Nat. in which Choisy proposes *guineensis* on account of the preoccupation of *glabra* by the Banksian plant. The restoration of the earliest trivial will necessitate a new combination for *H. glabra*, but I purposely abstain from making it, as I think such changes, except where absolutely necessary, should be left to monographers, or at least to workers at a genus.—JAMES BRITTEN.

JUNCUS PYGMÆUS Thuill. IN CYPRUS ?—This species is recorded in Boissier, *Flora Orientalis*, vol. v, "Ex Insula Cypro prope Larnaka. Majo 29. 1877, J. Ball. No. 2436." The specimens with that number in the Kew Herbarium, to which the late Mr. Ball added, "The only Oriental specimens seen by Boissier," are certainly *Juncus bufonius* L. The geographical range of *J. pygmæus*, given by F. Buchenau in Engler's *Jahrbuch*, 1890, p. 280, is therefore lessened. Buchenau gives "bis Cypern und Kleinasien (Smyrna, *Balansa*) . . . ." as the easternmost limit of the plant.—H. STUART THOMPSON.

NOTICES OF BOOKS.

The Fungus Flora of Yorkshire: a Complete Account of the known Fungi of the County. By G. MASSEE, F.L.S., F.R.H.S., and C. CROSSLAND, F.L.S. 8vo, pp. 396. London: A. Brown & Sons. 1905. Price 10s. 6d. net.

A NEW departure in mycology is signalled by the issue of this publication—vol. iv. of the *Botanical Transactions of the Yorkshire Naturalists' Union*—the first independent county fungus flora published. Lists of fungi, or of groups of fungi, have been included in various floras and county histories, but nothing so extensive or complete as this work. The study of fungi has been followed in Yorkshire by a band of able and devoted workers, and we have before us the result of many years' labour, though, justly enough, the authors remark that this is "only a first instalment." The number of species they have recorded up to date is 2626; the number for the whole world is now 52,000. In a large county like Yorkshire, with its varieties of locality and altitude, a vast hunting-ground is provided for the botanist. In mere extent of territory Yorkshire takes the lead of all English counties, and though the record is already a large one, there are many gaps that are certain to be filled up in time. The discovery and determination of microscopic forms is a work requiring considerable time, and much remains to be done in that group.

As year after year the new forms discovered were duly recorded in the Yorkshire *Naturalist*, the present work merely gives the name and habitat of the plant, with the name of the finder. There are no novelties in the list. *Echinella* figures as a new genus of Discomycetes, but it was published in Massee's *Fungus Flora* in 1895. Two species are placed under *Curreyella*, a genus also founded by Massee in his *Fungus Flora* to include *Peziza*-forms with globose spores, which become brown at maturity. One, *C. trachycarpa*, grows only on burnt ground, and has been recorded from Ascot, Shrewsbury, and now from Hebden Bridge. In founding *Curreyella*, Massee rejected Saccardo's *Detonia*, as that genus took no account of the changing colour of the spores; but there still remains *Plicariella*, which includes the species in dispute.

This was first suggested by Saccardo as a subgenus in 1884 for forms with brown globose spores, and then raised to generic rank and published by Rehm in Rabenhorst's *Discomycetes* in 1894, a year before vol. iv. of the *Fungus Flora* was issued. It is eminently desirable to bring our systematic work into line with that of continental botanists, and it seems a pity that such a clear case of priority should be ignored by the authors of this list. It is also a matter for regret that they have so frequently omitted to give the authority for the binominal designation of the fungi: thus, for example, under *Coprinus* we find *C. micaceus* (Bull), *C. deliquescens* (Bull)—the fungologist Fries, who is responsible for the nomenclature as it stands, being ignored. Again, they print *Coprinus aratus* (B. & Br.); the indication of a change in the name is misleading, since Berkeley and Broome originally placed that species in *Coprinus*. In several cases species are recorded under different names, as, for instance, *Psilocybe spadiceum*, a synonym of *Hypholoma hydrophilum*, and *Cephalothecum candidum*, the same mould as *Trichothecum roseum*. These are regrettable blemishes in a work which bears evidence of much care in its preparation.

The list of fungi, including Mycetozoa, is well up to date, though a few omissions have to be chronicled, such as the species of Mycetozoa discovered in Yorkshire by Mr. T. Petch, and published by A. and G. Lister in this Journal in 1904.

The authors give a classified table of the species found in Yorkshire; the Agaricaceæ easily head the list with 53 genera represented and 946 species; the Discomycetes come next with 75 genera and 429 species. This work should give a new impulse to the field study of this group of plants, and the thanks of mycologists are due to the Yorkshire botanists who have helped to bring it to a successful issue.

A. L. S.

The Uses of British Plants traced from Antiquity to the Present Day, together with the Derivations of their Names. By the Rev. Prof. G. Henslow, M.A., F.L.S., &c. With 288 illustrations. 8vo ed., pp. 184. Price 4s. 6d. net. Lovell Reeve.

This little work cannot in any sense be said to justify its somewhat ambitious title. Its real object appears to be to circulate in another form the very excellent illustrations prepared by Mr. H. Fitch to accompany Bentham's Handbook. As it was desirable to utilize as many of these as possible, plants are included which have, so far as Prof. Henslow's text goes, no "uses" to boast of; such, for example, as *Impatiens Noli-me-tangere* and *I. fulva* (*biflora*). Plants of real economic importance, of whose history an interesting account might have been given, are treated with brevity; the "derivations of their names" are very unsatisfactorily dealt with and not always enlightening: *e.g.*, "Poor Man's Weather-glass . . . from the flowers closing as soon as the sun is off" (p. 114); "Lady's Smock, Cuckoo-flower . . . . from ladies' dresses (!) and the time when the cuckoo appears" (p. 16)—nothing is said to connect the

plant with the spring and thus with the cuckoo. Many are unexplained, and the explanation of a generic name is sometimes placed under a species to which it does not apply; e. g., *Linaria*, "from the flax-like foliage," is given under *L. Cymbalaria* not *L. vulgaris*, to which the name originally belonged, and *Cymbalaria* is unexplained; is the plant really "eaten as a salad"?

Prof. Henslow's botany is far from blameless, and he does not seem acquainted with the distribution of British plants—*e. g.*, he tells us that *Iberis amara* "is wild near Hitchin, and has long been cultivated as a garden plant, with a much-improved form of flower, with white or crimson petals" (p. 24), from which it would seem that he thinks *I. umbellata* is a cultivated form of *I. amara*. The Arbutus is "a native of *the mountains* of Killarney" (p. 110). *Rubus Chamæmorus* "is a native of the mountains of Scotland and Ireland" (p. 60)—why is the north of England excluded?; "the wild Raspberry takes the place of the Blackberry in the North, as about Perth, and even at Buxton in Derbyshire, occurring in woods and hedges; the berries (!) are as pleasant to eat. but smaller than those of the cultivated variety" (*ib.*). This last sentence is an example of the astonishing slipshoddity and carelessness which characterize the book throughout—*e. g.*, "Perhaps the fact that species growing in cracks of rocks were thought to break them; hence their use by the supposed law of signatures" (p. 74); "like the last it has been used for the same purpose" (p. 124). On p. 92 we read, "Danewort (*Sambucus* Plin., *Ebulus* Virgil). The origin of the English name is obscure"; and, only eight lines later, "the origin of 'Danewort' is obscure."

We cannot think that this little book will add to the reputation of author or publishers, though it is due to the latter to say that it is well printed and well got-up.

BOOK-NOTES, NEWS, &c.

The Rev. James Keith died at his residence at Forres, Aberdeenshire, on August 11. He was born in Keith on Dec. 23, 1825, and was educated at the parish school, whence he went to the University in Old Aberdeen, where he graduated M.A. in 1845. After a few years as a schoolmaster, Keith became minister of Forres, a post he retained until 1899. The following account of his botanical work is from the *Annals of Scottish Natural History* for October, to which we are also indebted for the foregoing particulars: "Not robust in youth, his studious life told on his health, which for a time was not satisfactory. Fortunately his medical adviser, Dr. Innes, of Forres, was interested in natural history, and sent him, as the prescription best suited to his needs, a botanical case and a flora, with the advice to use both regularly. He did so, and soon acquired a love of natural history, and especially of plants, that grew ever stronger and that enabled him to make valuable contributions to the study of the

flora of the Province of Moray. The early volumes of the *Scottish Naturalist* contain very excellent lists by him of the 'Mosses found in the Vicinity of Forres' and of the 'Fungi of Morayshire,' and short botanical notes. He aided others with his knowledge and with specimens most willingly, and was recognized as one of the most accurate mycologists in Scotland. The *Mycologia Scotica* and *British Hymenomycetes* of the Rev. John Stevenson, LL.D., and the *British Uredineæ and Ustilagineæ* of Dr. Plowright bear testimony to the worth of Dr. Keith's researches, as do also the well-known papers by Mr. Berkeley in the *Annals and Magazine of Natural History*. He discovered a number of additions to the British lists of fungi, of which some were new to science, and of which *Polyporus Keithii* B. & Br. and *Peziza Keithii* Phill. commemorate him. He took a keen interest in the Forres Museum, and contributed both personal services and specimens to it. Despite his age he took part enthusiastically of late years in the work and excursions of a Field Club in Forres of which he was president. In 1882 the degree of LL.D. was conferred on him by the University of Aberdeen, in recognition of his merit as a naturalist and of his public services."

THE last part of the *Journal of the Linnean Society* contains among other papers of interest an account of the collections made by Dr. Bagshawe during the Anglo-German Uganda Boundary Commission under Lieut.-Col. Delmé Radcliffe, and presented to the National Herbarium. The 480 phanerogams include 67 species new to science, three of which—*Trimeria macrophylla* Baker fil., *Erythrococca Paxii* Rendle, *Hæmanthus Radcliffei* Rendle, and a new genus *Styasasia*—based on *Asystasia africana* and established by Mr. Spencer Moore—are figured. The Polypetalæ are elaborated by Mr. E. G. Baker; Mr. Moore has undertaken the Gamopetalæ; the Apetalæ and Monocotyledons are undertaken by Dr. Rendle.

DR. F. E. CLEMENTS'S *Research Methods of Ecology* (Lincoln, Nebraska) will necessitate considerable additions to the next edition of Mr. B. D. Jackson's *Glossary of Botanic Terms*. Ecology, as a new branch of science, may require a new nomenclature, and, if this be so, Dr. Clements has certainly supplied it. His copious glossary would afford ample material for a "puzzle page," and a frivolous correspondent has suggested that we might enliven the Journal by this addition, and perhaps, by adopting the popular practice of offering prizes for the best answers, increase its circulation. Thus: "Define a stasad, a sterrhad, a taphrad, a telmatad, a thinad, a tiphad, and a tirad, and give examples of each." "What do you mean by a zoochore, and what is a phytostrote?" "Explain the terms immobile, copious, mutation, society, exclusive, succession, mutable." [This question may be recommended as calculated to pluck most candidates.] "Translate the following: Passing through the heliophilous poads and poophytes, we arrived at a forewold abounding in driodads and sciophytes, the cyriodoche of the latter being somewhat interfered with by pyrium and ecballium; further

on, hylads, hylodads, and hylophytes diversified the scene." Apart from its phraseology, the book seems to be an important contribution to ecology; should a copy reach us for review, we should treat it more seriously than a casual inspection has rendered possible.

As a memento of his long association with botanical teaching and research at Cambridge, Mr. Francis Darwin was asked to sit for a portrait, by Mr. W. Rothenstein, which was presented on Saturday, October 28th, to the Botanical Department of the University. The presentation formed the occasion of an interesting gathering of Mr. Darwin's former pupils.

Mr. C. E. Salmon sends us a reprint from "*The South-Eastern Naturalist*, 1905," of an interesting paper on the flora of the Reigate district, compiled by himself and Mr. R. H. Welchman, which, we gather from the text, was read before some recent Congress. We are inclined to doubt whether, for the general reader, "J. B." is not too abbreviated an indication of this Journal; and "Solius Lanbrach" is a curious rendering of "Solms Laubach."

The *Daily News* continues its excursions into botany—thus: "One of England's forgotten crops is well on its way to maturity. The berries of the Service-tree (*Pyrus domestica*) in the London district are beginning to redden, and they will be fully ripe late in September. This tree is fairly familiar to many of us in the metropolis, but how many have any notion of its history? Its berries, seldom eaten nowadays, made a favourite confection in the Middle Ages, when the dietetic habits of all Europe were so very different from those prevailing now. They were prepared for the table with honey, sugar being then unknown. But the Service has gone to the dogs; its berry has fallen on unappreciative times. Nobody takes the trouble to pick it, though it is said to possess medicinal virtues when dried, and our people do not, as a rule, neglect nostrums. The crop this year is poor. It was unusually heavy in the wet season of 1903." Perhaps some readers may be among the "many in the metropolis" to whom the tree is "fairly familiar"; we ourselves are not so fortunate.

A new periodical, edited by Dr. F. Fedde—*Repertorium novarum specierum regni vegetabilis*, further described as "Centralblatt für Sammlung und Veröffentlichung von Einzeldiagnosen neuer Pflanzen"—is being published at Berlin by the brothers Borntraeger. The first number contains new species of *Spiræa* by C. K. Schneider; a new *Alopecurus* (*A. Bornmülleri*) by Dr. K. Domin; *Agapetes Hosseana* Diels, n. sp.; and various reprints from other works.

The Report of the Botanical Exchange Club for 1904, by Mr. James Groves, has appeared. We hope to give some extracts from it in an early number.

Mr. William Phillips, of Shrewsbury, died at that place on October 22nd, at the age of eighty-three. A further notice will appear later.

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The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

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SOME CRYPTOGAMS FROM CHRISTMAS ISLAND.

By A. & E. S. Gepp.

This small collection of cryptogams was made by Mr. H. N. Ridley during October, 1904, at Christmas Island. This island is situated in the Indian Ocean nearly 200 miles to the south of Java, in S. lat. 10° 25′, E. long. 105° 42′. It must not be confused with the Polynesian island of the same name in N. lat. 1° 40′, W. long. 156° 20′. An excellent "Monograph of Christmas Island (Indian Ocean)," by Dr. C. W. Andrews, was issued by the Trustees of the British Museum in 1900. It treats of the physical features, geology, and natural history, being founded on the observations and collections made by Dr. Andrews during a visit extending over ten months in 1897–8. To this valuable record we are indebted for the following details.

The island has an area of about forty-three square miles, and in places reaches an altitude of over 1000 ft. It is the flattened summit of a submarine mountain standing in very deep water. It is covered by a dense tropical vegetation, and had remained uninhabited until a few years ago, being almost inaccessible on account of the steep cliffs which surround it. These cliffs are for the most part much undercut, and sometimes overhang to the extent of thirty feet or more, being eroded by the heavy seas that ever beat against the island. Round the greater part of the island is a fringing reef, always submerged to a greater or less depth, except at Flying Fish Cove, West White Beach, and a few small bays on the east coast—for example, near the Waterfall (Panchorán)—where at low water the reef is partly dry, but mostly covered with less than a foot of water. The beach at these places is composed of a varying slope of coral shingle, which at Flying Fish Cove forms a crescent some five hundred yards long.

No algæ have hitherto been recorded from the island. Mr. Ridley says that he found it to be impossible to get down to the water's edge at more than two or three places. And even these places appear to be unfavourable to the growth of algæ; for the specimens are stunted and unsatisfactory. This is due to the heavy beat of the surf. We learn from Dr. Andrews's account that the prevalent wind is from the E.S.E.—the trade wind—and blows on an average for three hundred days during the year; but that during the earlier months of the year—the rainy season—the wind occasionally shifts round and blows hard from the N. or N.E., at which time the sea breaks with great violence on the reef in Flying Fish Cove, which is situated on the north coast. And Waterfall Cove, on the east coast, would suffer still more severely but for a submerged reef which breaks the force of the waves. It is unlikely that any algæ exist elsewhere than in the few sheltered bays referred to. Unfortunately, Mr. Ridley's labels give no indication as to whether the specimens were found growing in rock-pools or on ledges or had been thrown up on to the beach.

Those from the vicinity of the Waterfall may have suffered from the action of its fresh water.

As regards the mosses and lichens, most of them were collected on the Plateau or on Phosphate Hill. Further details are lacking; but almost all of the specimens appear to have been growing epiphytically on bark. Mr. Ridley says that his visit to the island was made during an extremely dry season, when of course the mosses were mostly withered; otherwise he would probably have found more. As to the rainfall, Dr. Andrews says it is heavy, but that almost the whole of it occurs between December and May; and that during the dry season (May to December) there are heavy dews, with occasional showers at night on the uplands.

Hitherto only seven species of mosses, one hepatic, nine lichens, and no algæ have been recorded from the island. Mr. Ridley's collection adds twelve mosses, three lichens, and twenty-two marine algæ. Further additions, both native and immigrant, may be expected in the future. Possibly more new species will be found when the remote parts of the island have been rendered more accessible by road-cutting through the dense forest. Other species may be introduced from Java by the ships which call with supplies on their way from Batavia to the Cocos-Keeling Islands. These immigrants would naturally become established first at Flying Fish Cove, the landing-place of the island and the site of the settlement, and spread from there—the marine algæ along the coast, the mosses, &c., along the roads already cut. The cryptogamic species hitherto discovered on the island are, as might be expected, nearly all of the Indo-Malayan type.

The novelties described below are a red alga, *Halymenia polyclada*, and a pleurocarpous moss, *Ectropothecium micronesiense*. For the detailed description of the latter and for the identification of *Isopterygium Jelinkii* we owe our thanks to Herr Max Fleischer, whose unrivalled knowledge of the moss-flora of Java and the Malay Islands is bearing such excellent fruit in the publication of his *Musci der Flora von Buitenzorg* and *Musci Archipelagi Indici exsiccati*. To Miss A. Lorrain Smith we are indebted for help in the determination of the lichens.

Algæ.

1. *Ulva Lactuca* L. Sp. Pl. ed. iii. p. 1632 (1764).
Near Waterfall, no. 235*b*.
Geogr. Distr. Cosmopolitan.

2. *Enteromorpha compressa* Grev. Alg. Brit. p. 180 (1830).
Waterfall Cove. Near Waterfall, no. 235*c*.
Geogr. Distr. Cosmopolitan.

3. *Chætomorpha javanica* Kütz. Sp. Alg. p. 376 (1849).
Near Waterfall, no. 235*d*.
Geogr. Distr. Java. Mauritius.

4. *Cladophora repens* Harv. Phyc. Brit. tab. 236 (1851).
Flying Fish Cove, no. 225. Near Waterfall, no. 234.
Geogr. Distr. Mediterranean. N. Atlantic. Indian Ocean.

5. *Siphonocladus Zollingeri* Bornet ex Hariot in Journ. de Bot. i. p. 56, adnot. (1887).
Flying Fish Cove, no. 239.
Geogr. Distr. Java.

6. *Caulerpa peltata* Lamour. in Journ. de Bot. p. 145 (1809).
Waterfall, no. 242 pro parte. Bleached plants, intermingled in a mass with *Hypnea pannosa*.
Geogr. Distr. Red Sea. Indian Ocean. Cape of Good Hope. N. Atlantic. West Indies. S. Pacific.

7. *Avrainvillea lacerata* J. Ag. Till Alg. Syst. viii. p. 54 (1886).
Flying Fish Cove, no. 224. Waterfall Cove, no. 243.
Geogr. Distr. Red Sea. Mauritius. Philippines. Friendly Islands.

8. *Sargassum Wightii* Grev. in J. Ag. Sp. Alg. i. p. 329 (1848).
Near Waterfall, Oct. 1904, no. 237.
Geogr. Distr. Indian Ocean.

9. *Turbinaria ornata* J. Ag. Sp. Alg. i. p. 266 (1848).
Flying Fish Cove, no. 226.
Geogr. Distr. Indian Ocean. N. and S. Pacific.

10. *Padina Commersonii* Bory in Duperrey Voy. de la Coquille, p. 144 (1828), t. 21, fig. 2 (1826).
Flying Fish Cove, no. 230.
Geogr. Distr. Indian Ocean. N. and S. Pacific. West Indies.

11. *Dictyota dichotoma* Lamour. in Desv. Journ. de Bot. ii. p. 42 (1809).
Waterfall Cove, Oct. 1904.
Geogr. Distr. Cosmopolitan.
The habit of this specimen is very peculiar, the plant being attached to its substratum by rhizoids given off from any part of the thallus. We have asked Mr. Lloyd Williams his opinion on it, and he kindly writes to us as follows : "Besides the rhizoids, which you call attention to, there are numerous adventitious branches. The nearest approach to this found growing on our coasts are very dwarf plants which grow on surf-beaten rocks about the *Himanthalia* and *Nemalion* level and in very shallow depressions in the rocks, mixed with calcareous algæ, etc. In such situations, besides being very small, the plants have numerous rhizoids and adventitious branches, and in addition the reproductive cells instead of maturing and liberating in the usual way, frequently divide vegetatively to such an extent that the surface becomes quite rough and uneven. With regard to rhizoids, the formation of them is very easily induced; dirt or even zooglœa masses cause them to grow on any part of the surface." Neither Mr. Lloyd Williams nor we ourselves found any reproductive organs on this specimen.

12. *Chnoospora fastigiata* J. Ag. Sp. Alg. i. p. 171 (1848).
Near Waterfall, no. 233.
Geogr. Distr. Warm Atlantic. Warm Pacific. Indian Ocean.

13. *Ectocarpus spongiosus* Dickie in Journ. Linn. Soc. xiv. p. 191 (1874).

Waterfall Cove, no. 243. Growing on *Chnoospora* near Waterfall, no. 233.

Geogr. Distr. Indian Ocean.

Harvey and Bailey, in the Algæ of the U.S. Exploring Expedition commanded by Capt. Wilkes (p. 166, tab. vii. figs. 3–5, 1862), have described "a very curious and well-characterized species" from Cape de Verde Islands—*E. hamulosus*—which appears to agree so closely with *E. spongiosus* from Mauritius and the Laccadive Islands that we firmly believe it to be identical. Should this prove to be the case, the name *E. hamulosus* would take precedence of *E. spongiosus*. As we have not seen the Cape de Verde plant, we must leave the name unchanged.

14. *Bangia ciliaris* Carm. subsp. *B. dispersa* Mont. Syll. Crypt. p. 460 (1856).

On *Halymenia polyclada* Gepp. Flying Fish Cove. No. 231, pro parte.

Geogr. Distr. Martinique.

Madame Weber van Bosse, who was so kind as to compare *Halymenia polyclada* with her own collections of that genus, detected this minute *Bangia* growing on the thallus of that alga, and after careful examination she finds it belongs to the above species. She says it is smaller than Montagne's plant of *B. dispersa*, and, though some of the filaments reached a length of 240 μ, others of only 96 μ possessed already longitudinally divided cells. The cells vary from 6–8 μ in length, and from 8–12 μ in breadth. She adds that *Bangia* has not previously been recorded from this region.

15. *Rhodophyllis peltata* Grun. in Journ. de Mus. Godeffroy, vi. p. 34 (1874).

Flying Fish Cove, no. 232.

Geogr. Distr. Tongatabu.

The description of *R. peltata* Grun. in De Toni's Syll. Alg. vol. iv. 1, p. 349, agrees exactly with our specimen, which has a few cystocarps scattered over the surface, and these have the small papilla at the apex. The placentation is basal. *R. peltata* is only recorded from Tongatabu, and, as we have not seen either an authentic specimen or a figure, we refer our plant to that species with some hesitation.

16. *Gracilaria corticata* J. Ag. Sp. Alg. ii. p. 602 (1863).

Waterfall Cove, no. 240. A fragment only, doubtfully referred to this species.

The specimen resembles in habit the plants in Herb. Mus. Brit. collected at Mauritius by Cosmo Melvill, and called by him *G. corticata*; as also a specimen from Dar es Salaam (Holst, no. 126 *a*), named by Schmitz *G. corticata* var. *ramalinoides*. In section, however, the walls of the Mauritius plant are slightly thinner than those of our plant.

17. *Hypnea pannosa* J. Ag. in Öfv. K. Vet.-Akad. Förh. iv. p. 14 (1848).

Waterfall, Oct. 1904, intermixed with *Caulerpa peltata*. No. 242, pro parte.

Geogr. Distr. Indian Ocean. Mexico.

18. *Bostrychia tenella* J. Ag. Sp. Alg. ii. p. 3 (1863).
Blow Hole beyond Waterfall, no. 238.
Geogr. Distr. Indian Ocean. Warm Atlantic. S. Pacific.

19. *Ceramium clavulatum* Ag. in Kunth Syn. Pl. Æquin. i. p. 2 (1822).
Near Waterfall, no. 236.
Geogr. Distr. All warm oceans.

20. **Halymenia polyclada,** n. sp. Frons gelatinoso-membranacea, plana, 15 cm. alta, e callo basali subito late expansa, 2·5 cm. lata, mox palmate ramosa; rami breves lati (0·6–0·7 cm.), iterum iterumque irregulariter dichotomi, marginibus integerrimis; ramuli supra axillas rotundatas conniventes, sensim minores et angustiores, segmentis terminalibus brevissimis divaricatis.
Hab. Christmas Island. Flying Fish Cove, Oct. 1904, coll. *H. N. Ridley*, no. 231.
The inner structure of the thallus consists of sparse, interlaced, fine filaments, embedded in gelatine; the cortical cells are minute, in a series of 3–4 rows, perpendicular to the surface. From its nearest ally, *H. formosa*, it differs in having a *dichotomous*, not a *pinnate*, ramification; a much denser habit; quite entire margins; and medulla composed of finer and more abundant filaments. At first sight it reminds one of *Calophyllis coccinea*, but it differs in being branched dichotomously, and in having shorter branches and denser habit—besides being, of course, entirely different in internal structure.

21. *Corallina* sp.
Waterfall, no. 241. Broken fragments only.

22. *Jania micrarthrodia* Lamour. Polyp. Flex. p. 271 (1816).
Near Waterfall, Oct. 1904, no. 235.
Geogr. Distr. Australia. New Zealand.

Musci.

1. *Fissidens Hollianus* Doz. & Molk. Bry. Jav. i. p. 4, tab. 4 (1855).
Plateau, no. 215.
Geogr. Distr. Java. Sumatra.

2. *Leucobryum chlorophyllosum* C. Muell. Synops. ii. p. 535 (1851).
Plateau, no. 214.
Geogr. Distr. Java. Celebes. Timor. Ceylon.

3. *Leucophanes glaucescens* C. Muell. ex Fleisch. Musci Flor. Buitenzorg, i. p. 178 (1904).
Plateau, no. 214 ex parte; Irvine Hall, no. 202 ex parte.
Geogr. Distr. Java. Sumatra. Andaman Islands.
A few small plants of this were found nestling in tufts of larger mosses.

4. *Hyophila apiculata* Fleisch. Musci Flor. Buitenzorg, i. p. 325 (1904).
Flying Fish Cove, no. 204 pro parte.
Geogr. Distr. Java.
Two minute plants found in a tuft of *Ectropothecium micronesiense*.

5. *Thyridium fasciculatum* Mitt. in Journ. Linn. Soc. x. p. 189 (1869).

Phosphate Hill, no. 205; Waterfall, no. 205 *a*.

Geogr. Distr. Java. Ceylon. Polynesia. Bourbon. Chili.

6. *Calympores hyophilaceum* C. Muell. ex Besch. in Ann. Sci. Nat. sér. viii. tom. i. pp. 265, 287 (1895).

Irvine Hall, no. 212 pro parte.

Geogr. Distr. Java. Sumatra.

Three minute plants of this species were found in a tuft of *Ectropothecium micronesiense*.

7. *Syrrhopodon revolutus* Doz. & Molk. Musc. frond. ined. Archipel. Ind. p. 59, tab. 22 (1846).

Phosphate Hill, no. 213.

Geogr. Distr. Malay Archipelago. Bourbon. Madagascar.

This species belongs to the subgenus *Leucophanella* Fleisch.

8, *Orthorhynchium philippinense* C. Muell. in Linnæa, xxxvi. p. 30 (1869).

Syn. *Neckera phyllogonioides* Sulliv. in Proc. Amer. Acad. iii. p. 181 (1855), et in Wilkes U.S. Expl. Exped. p. 20, tab. 17 A (1859).

Phosphate Hill, no. 210.

Geogr. Distr. Philippine Islands.

To this species Sullivant's plant must be referred. The species has yet to be recorded from the other islands of the Malay Archipelago, hitherto having doubtless been overlooked as a small immature form of *Phyllogonium*.

9. *Neckera loriformis* Van den Bosch & Lac. Bry. Jav. ii. p. 63. tab. 183 (1863).

Plateau, no. 217.

Geogr. Distr. Malay Archipelago. Fiji. Samoa.

10. *N. Lepiniana* Mont. in Ann. Sci. Nat. x. p. 107 (1848).

Plateau, no. 219.

Geogr. Distr. Malay Archipelago. Polynesia. Ceylon. Mauritius. Rodriguez.

11. *Callicostella prabaktiana* Van den Bosch & Lac. Bry. Jav. ii. p. 40, tab. 163 (1862).

Irvine Hall, no. 202; Plateau, no. 201 (pro parte), 214 (pro parte).

Geogr. Distr. Java. Borneo.

12. *Taxithelium instratum* Broth. in Fleisch. Musc. Archip. Ind. Exsicc. fasc. vii. (1905).

Syn. *Trichosteleum instratum* Jaeg. & Sauerb. Gen. et Sp. Musc. ii. p. 478 (1878).

Plateau, no. 200; Phosphate Hill, no. 206.

Geogr. Distr. Malay Archipelago.

13. *Isopterygium Jelinkii* Fleisch.

Syn. *Sigmatella Jelinkii* C. Muell. in herb.

Plateau, no. 201.

Geogr. Distr. Samoa.

As C. Mueller's plant has not been described, we await the description which Herr Fleischer will give in his *Musci der Flora*

von Buitenzorg; and in the meantime we append the following notes drawn from the Christmas Island plant. It is autoicous, with small gemmiform male flowers borne laterally on the stem; the plant is slender, and forms depressed pale green tufts; the stem creeps closely on bark, emitting rootlets at frequent intervals along its whole length, and is closely and irregularly pinnate; the branches are patulous, 4–5 mm. long, complanate; the leaves are 0·8–1·0 mm. long, ovate-lanceolate acuminate, hollowed, with margins erect serrulate (minutely below, markedly at apex), with apex oblique; nerves none; the leaf-cells are elongato-hexagonal, 50 μ long × 6 μ wide; alar cells 4–5, quadrate to subrectangular. Perichætial bracts long (up to 2·4 mm.), sheathing, erect, longly acuminate, serrulate.

14. **Ectropothecium micronesiense** Fleischer, sp. n. *Autoicum.* Flores masculi in caule laterales, sessiles, minuti, gemmiformes; folia perigonii ovata, breviter acuminata. *Plantæ* tenellæ, graciles, cæspitosæ, cæspitibus depressis, viridibus, nitidiusculis. *Caulis* repens per totam longitudinem, cortici adnatus, hic illic radiculosus, valde foliosus, densiuscule vel vage irregulariter pinnatim ramosus, ramis adpressis vix ultra 5–6 mm. longis, arcuatulis, complanatis, laxe foliosis, obtusiusculis. *Folia* disticha, caviuscula, brevia, ovato-lanceolata, breviter acuminata, marginibus erectis, superne minutissime serrulatis, apice obliqua, costis binis brevibus, obsoletis vel nullis. *Cellulis* parce chlorophyllosis, elongato-hexagonis, 9–12 μ latis et 35–50 μ longis, lævibus vel apice prominentibus, apicalibus brevioribus, basilaribus infimis abbreviatis, ad alas subquadratis. *Bracteæ perichætii* foliis majores, erectæ, e basi subvaginante sensim acuminatæ, enerves, integræ; vaginula cylindrica. Seta usque ad 1·5 cm. alta, erecta, flexuosula, purpurea, basi crassa, lævissima. *Theca* horizontalis vel inclinata, ovalis, asymmetrica, minuta, sicca sub ore valde constricta, brevicollis, submamillosa, pallida, fusca, operculum e basi convexo breviter apiculatum; exothecii cellulæ hexagonæ vel subquadratæ, collenchymatico-incrassatæ. Annulus persistens; calyptra glabra. Peristomium duplex; exostomii dentes sicci apice incurvi. humidi conniventes, lanceolati, sensim angustati, minute papillosi, apice pallidi et scabridi, densissime striati et alte lamellati, linea media notati; endostomium flavidulum, processus dentibus æquilongi, carenati, dense papillosi, viz perforati; cilia singula, lata, breviora, hyalina, papillosa. Sporæ 15–18 μ virides, punctatæ.

Patria: Insula Christmas, Irvine Hall, ad truncos arborum, leg. *H. N. Ridley* (no. 212).

Species *E. cyperoidi* similis, sed foliis complanatis, laxius reticulatis, minus serratis, [cellulis] alaribus non conspicuis, in statu sterili jam diagnoscenda.

The following specimens also represent this species: Flying Fish Cove, no. 204; Phosphate Hill, nos. 203 (unlocalized), 207, 208, 209, 211.

15. *E. monumentorum* Jaeg. & Sauerb. Gen. et Sp. Musc. ii. p. 523 (1879).

Irvine Hall, no. 212 pro parte.

Geogr. Distr. Java. Sumatra. Banca.

Herr Fleischer found small bits of this species intermixed with *E. micronesiense*, and growing on the same piece of bark. To separate them from the latter species it is necessary to employ the microscope.

HEPATICÆ.

1. *Ptychanthus striatus* Nees ab Es. Hepat. Eur. iii. p. 212 (1838). Plateau, No. 218.
Geogr. Distr. Malay Archipelago. India. Japan. Tropical Africa.

LICHENES.

1. *Usnea articulata* Hoffm. Deutschl. Flor. ii. p. 135 (1795). Phosphate Hill, no. 222.
Geogr. Distr. Cosmopolitan.

2. *Ramalina calicaris* Fries, Lich. Eur. p. 30 (1831). Phosphate Hill, no. 220; Flying Fish Cove, no. 223.
Geogr. Distr. Widely distributed in Asia, Europe, America.

3. *Parmelia perforata* Ach. Meth. p. 217 (1803). Phosphate Hill, no. 221.
Geogr. Distr. Cosmopolitan.

The fragmentary specimen appears to be a state of *P. perforata*, and with it is associated an incomplete lichen which perhaps should be referred to *Squamaria*.

CLASSIFICATION OF PLANTS.

BY A. B. RENDLE, M.A., D.Sc.

IT may be of interest to call attention to two exhibitions of historical value which have recently been placed on view at the Natural History Museum. One, an exhibition of old natural history books illustrating the origin and progress of the study of Natural History up to the time of Linnæus, has been arranged, with assistance, by Mr. B. B. Woodward. Of botanical interest are works of Theophrastus, Pliny, and Dioscorides illustrating the classic period, a copy of the *Ortus Sanitatis*, several Continental and British Herbals, Robert Hooke's *Micrographia*, and Nehemiah Grew's classic *Anatomy of Plants*; while several of John Ray's works and Sir Hans Sloane's book on *The Natural History of Jamaica* bring us up to the Linnean period. This exhibition will be found in the Great Hall of the Museum. The other, placed in the public gallery of the Department of Botany, is an attempt to show in a limited space by means of books and brief explanatory labels the history of the classification of plants, and the gradual evolution of a more or less Natural System. It is a comment on the historic value of the botanical library that such an exhibition was possible after its resources had been heavily taxed for the supply of the more general exhibition to which we have just referred.

The classical writers on Natural History—Theophrastus, Pliny, and Dioscorides—were acquainted with a large number of plants, to

which they referred in their descriptions as herbs, shrubs, trees, fruits, cereals, and in similar terms indicating the manner of growth, or the economic use of the plant. They had no general system of classification, but gave a short and very imperfect description of the plant, an indication of its habitat, and an account of its preparation and use in medicine. A copy of the *Materia Medica* of Dioscorides is shown, the first printed edition in the original Greek, from the press of Aldus Manutius at Venice, dated 1499.

There is little or nothing to record in the way of progress from the time of the classic writers to that of the botanical renaissance represented in the earlier German Herbals. The *Ortus Sanitatis*, first printed at Mainz in 1475, of which many editions appeared in various languages, indicates the miserably low state of the study of Natural History in the Middle Ages. It is a work on general Natural History, including animals, plants, and stones; but the very crude descriptions and woodcuts show little or no acquaintance with the objects treated. The fact that a work of so low a standard was generally accepted and widely used suggests a general abeyance of the powers of observation in the study of plants. It is a pleasure to turn from such a book to the Herbals, several of which appeared on the Continent towards the middle of the sixteenth century. The *Herbarium* of Otto Brunfels, which was published at Strasburg (1530–36), marks a new era, the beginning of modern botany. Instead of copying old descriptions and figures, with additions drawn from the imagination, as earlier writers had been doing, Brunfels went direct to Nature, and made descriptions from the actual plants, and had woodcuts made, many of which are excellent examples of their kind. Working on similar lines, Hieronymus Bock published his *Kreütter Buch* in 1539, and Leonhard Fuchs his *Historia Stirpium* in 1542; the latter is especially noteworthy for its beautiful illustrations. Careful observation and description of the plants led unconsciously to considerations of arrangement. It was recognized that there were several plants of the same kind, or, as we should express it, species of a genus, and wider resemblances of habit led to the establishment of larger groups, such as grasses, rushes, orchids, and the like. A botanical terminology also gradually appeared; thus Fuchs devotes several pages to a glossary of difficult terms.

The father of English botany was William Turner, Dean of Wells, whose *Libellus de Re Herbaria novus* appeared in 1538, while in 1551 was published the first part of his *New Herbal*, in English and with inset illustrations, which, however, will not compare with those of Brunfels or Fuchs. As an example of the system of classification evolved by the herbalists, we may mention that of Matthias de l'Obel, a native of the Lowlands, who was at one time botanist to James I., and had a physic garden at Hackney; his system was adopted by John Gerard, whose *Herball or Generall Historie of Plants* appeared in 1597. Gerard's book was based on Dodoens' *Stirpium Historiæ Pemptades* (Antwerp, 1583), with additional notes on British localities; the blocks were those used

by Tabernaemontanus in his *Icones* (1590), with a few original additions. The plants are arranged in three books, "sorted as near as might be in kindred and neighbourhood." The first book includes grasses, rushes, corn, flags, bulbous or onion-rooted plants; the second, all sorts of herbs for meat, medicine, or sweet-smelling use; the third, trees, shrubs, bushes, fruit-bearing plants, resins, gums, roses, heath, mosses, mushrooms, cereals of their several kinds.

While it is obvious that Gerard's three books represent unnatural divisions based on superficial resemblances and on the uses of plants to man, the fact that most of the monocotyledons get together in the first book shows that general habit is some guide to affinity. We find, however, among the grasses, such diverse plants as *Butomus* and stitchwort (*Gramen leucanthemum*), while palms are excluded because they are trees, and the aroids, *Polygonatum*, and *Ruscus*, appear in the second book. The idea underlying these primitive attempts at arrangement was that narrow-leaved plants, such as grasses and the bulbous monocotyledons, represented simpler forms, from which we advance to the broader-leaved herbaceous dicotyledons, culminating in shrubs and trees, which were supposed to be most perfect. There is a total neglect of characters of fruit and seed.

The works of Kaspar Bauhin (a pupil of Fuchs), whose *Prodromus Theatri Botanici* appeared in 1620, and the *Pinax* in 1623, show a great advance. The general arrangement is still on the primitive lines of L'Obel and Gerard, but the descriptions are more scientific and free from the medicinal details which figured so prominently in earlier works. Forty years previously Andrea Caesalpino had studied the arrangement of plants from a philosophical point of view. He concluded that a natural classification must be based on the characters of fruit, seed, and embryo, but still recognized the main divisions into woody and herbaceous plants, and his arrangement shows no improvement on that of the later herbalists. His *De plantis Libri XVI* was published at Florence in 1583; it contains no general review of his system, which, however, is given by Linnæus in the *Classes Plantarum* (1738).

A natural system of classification was inaugurated in John Ray's *Historia Plantarum* (1686–1704). Ray kept the old main division into herbs and trees, but recognized the importance of the character of the embryo and the presence of one or two cotyledons. His establishment of two distinct groups of seed-plants—monocotyledons and dicotyledons—was the first step towards a natural division. Ray's subdivisions were thirty-three classes, some of which, such as Fungi, *Umbelliferæ*, *Stellatæ*, *Verticillatæ* (our *Labiatæ*), *Leguminosæ*, and *Stamineæ* (grasses), are natural groups; most of these had, however, been recognized by earlier workers; *Umbelliferæ* had been the subject of a monograph by Robert Morison, of Oxford (1672), whose arrangement of the order was based on the form of the fruit. About the same time Joseph Pitton Tournefort published his *Institutiones Rei Herbariæ* (Paris, 1900). His system was based on the characters of one organ, the corolla, and was therefore an

artificial one, thus comparing unfavourably with that of Ray, though many of the classes are identical. The chief merit of Tournefort's work is his accurate definition of genera.

The era inaugurated by the German herbalists was essentially one of accumulation of material; of collecting and describing plants, associated with the formation of herbaria and botanic gardens. There was a danger that the science might lapse into a mere mechanical process of plant-description. That this was a real danger is evident from the welcome with which Linnæus's so-called Sexual System was received. The number of plants known was enormously increased, and new ones were continually being discovered. A ready means of sorting the material was imperative, and this was supplied by the Linnean system, which put the least possible tax on the observing powers. It was necessary only to determine the number, or some equally obvious character, of the stamens and styles. Linnæus, however, regarded his system as only a temporary convenience, and expressed himself strongly in favour of a natural system in which genera should be arranged in orders by consideration not of any special predetermined mark, but of the simple symmetry, as he expressed it, of all the parts. The higher divisions, or classes, would follow when the orders had been settled. His *Classes Plantarum* (1738) contains an arrangement, under the title *Fragmenta Methodi Naturalis*, of all known genera in sixty-five orders, which in the *Philosophia Botanica* (1751) was raised to sixty-seven. Linnæus gave names to his orders, but no indication of their distinguishing characters, and he did not adopt Ray's distinction of monocotyledons and dicotyledons. Some of his orders represent natural groups, and had already been recognized as such by Ray and others; the majority are, however, more or less mixed, and, taken as a whole, are of very unequal value. In spite of his expressed determination to continue his work on a natural system during the remainder of his life, Linnæus went no further with its elaboration.

The further development of a natural system was owed to French botanists. Bernard de Jussieu adopted, with certain modifications, the Fragmenta of Linnæus in his arrangement of the plants in the royal garden at the Trianon. He continually worked at and greatly improved the limitation of the orders, and was followed on similar lines by his nephew, Antoine Laurent de Jussieu, whose *Genera Plantarum secundum Ordines naturales disposita* (1789) contains the first complete system which can claim to be a natural one. The orders of Linnæus, reorganized and greatly improved, are here arranged under the great groups owed to Ray—acotyledones, monocotyledones, and dicotyledones. The last group is divided according to the absence, and freedom or union when present, of the petals, and the one hundred orders are arranged in classes characterized by the relative position of the stamens and the ovary, a valuable character, but too consistently applied by Jussieu. Jussieu also published careful monographs of several families, recognizing that only by such work is a natural system attainable. The work was continued by Augustin Pyramus

de Candolle, who, in his *Théorie élémentaire de la botanique* (1813), clearly defined the principles which must underlie a natural system. He pointed out that characters which are of great importance in the life of the plant are often useless from a systematic point of view; it is to morphology and not to physiology that we must look for aid in establishing relationships. One of the most important contributions to the development and general adoption of a natural system was the *Prodromus Systematis Naturalis Regni Vegetabilis* (vols. i.–xvii., 1824–1873), a series of monographs of the families of dicotyledons and gymnosperms, edited by De Candolle and his son Alphonse, who continued the work after his father's death.

Knowledge of individual families, as well as their arrangement in a natural system, was also greatly advanced by the work of Robert Brown, who, by his investigation of difficult points in the morphology of the flower and seed, and his critical work on groups of doubtful or unknown affinity, ranks high as an expositor of the natural system. By showing, in 1827, that the female flower in conifers and cycads is really a naked ovule, he established the distinction between gymnosperms and angiosperms.

The system begun by the Jussieus and developed by the De Candolles finds its most complete presentation as regards the seed-plants in the arrangement adopted by Bentham and Hooker in the *Genera Plantarum* (1862–1883).

A most unsatisfactory feature in the earlier stages of the development of the natural system is the treatment of the cryptogams, especially in their relation to the higher plants. Thus the acotyledones of Jussieu contain only one class, and are comparable with the two other great groups—monocotyledones and dicotyledones; and A. P. de Candolle, while separating the cellular plants, includes vascular cryptogams with monocotyledons. John Lindley, in his *Introduction to the Natural System of Botany* (1830), gives a slight modification of De Candolle's arrangement, uniting the apetalous and polypetalous dicotyledons into one section, and making a sharp distinction between cryptogams and phanerogams. Stephan Endlicher (*Genera Plantarum*, 1836–40) distinguishes two main groups—Thallophyta (algæ, lichens, and fungi) and Cormophyta; but the division of the latter into three sections, corresponding practically to vascular cryptogams, monocotyledons, and dicotyledons (with gymnosperms), shows, in the light of modern knowledge, a want of appreciation of the relative value of the larger groups. Wilhelm Hofmeister's work (1851) on the embryology of the cryptogams and gymnosperms indicated the relationships of the divisions of cryptogams to each other and to the seed-plants, and led to the distinction of the great groups now generally recognized. To these we must add a new group, Cycadofilices, intermediate between Pteridophyta and Gymnosperms, which recent investigation of fossil plants has brought to light.

While a fairly general agreement has been reached as to the limitation of the great divisions of the plant world, there is some difference of opinion as to the arrangement of the smaller groups. A. W. Eichler (*Syllabus*, 1880) drew up a system which differs from

the Candollean in the union of the apetalous and polypetalous divisions of dicotyledons, the orders of which he attempted to arrange in a series advancing from the primitive to the most highly developed. A modification of Eichler's system by Dr. Engler is now in very general use on the Continent of Europe and in America.

A system widely differing from any other was recently proposed by Ph. van Tieghem (*Eléments de Botanique*, ed. 3, 1898). Van Tieghem recognizes the primary division of seed-plants into Gymnosperms (or *Astigmateæ*) and Angiosperms (*Stigmateæ*); but in the division of the latter he lays great stress on the development at the growing point of the root, forming three main divisions or classes, based on this character and the number of the cotyledons. Class i. includes monocotyledons as generally understood, without the grasses, which are regarded as dicotyledons; class ii. contains grasses and *Nymphæaceæ*; class iii. contains dicotyledons, except *Nymphæaceæ*. The subdivision of the dicotyledons depends on the presence or absence of a perfect seed and the characters of the ovule. Still more recently the same author, in a paper entitled "L'œuf des plantes considéré comme base de leur classification" (in *Ann. Sci. Nat.* ser. 8, t. xiv. p. 213) has published a general system, in which he introduces a large number of new terms. The large divisions are much the same as in his previous system, but the nomenclature is altered.

On very different lines is a scheme by Hans Hallier, of which a sketch was quite recently given in the *New Phytologist* for July. In this an attempt is made to incorporate anatomical, physiological, and œcological, as well as characters derived from all the other branches of botany. It is a mere outline sketch, containing, except for a few incidental remarks, no diagnostic characters. The general features are the following:—Angiosperms represent a monophyletic group. The *Amentaceæ* are not primitive types, and allies or descendants of Gymnosperms, but represent the highest and most reduced types of one of the lines of dicotyledons; these, like the other lines of dicotyledons, have been developed by reduction in flower and fruit from the *Polycarpicæ* (*Magnoliaceæ*, *Anonaceæ*, *Myristicaceæ*, *Calycanthaceæ*, *Monimiaceæ*, *Lauraceæ*), a cohort which is derived immediately from *Bennettitaceæ* or other extinct *Cycadales*. Similarly, the *Liliifloræ* and all the other syncarpous monocotyledons have been derived from the polycarpous monocotyledons (*Helobiæ*), which have come directly from the polycarpous dicotyledons (*Polycarpicæ* and *Ranales*). The *Apetalæ* and *Sympetalæ*, among the dicotyledons, are unnatural groups of polyphyletic origin.

The points here raised have been more or less under discussion for some years, but there has been perhaps among botanists a feeling of disinclination to apply them wholly or in part as the basis of a system until more information was forthcoming. And, briefly, it is from that point of view that one would criticize Dr. Hallier's system. The monocotyledons appear as the second group of Angiosperms, descended through the *Helobiæ* from *Nymphæaceæ*—otherwise the division has not yet been worked out.

Dicotyledons are arranged in eighteen cohorts, as follows:—*Polycarpicæ*, *Ranales*, *Rhœadales*, *Piperales*, *Malvales*, *Ebenales* (which, including *Convolvulaceæ*, are regarded as descendants of the last-named), *Geraniales*, *Myrtifloræ*, *Rosales* (a huge cohort containing thirty-five orders), *Ericales*, *Sarraceniales*, *Santalales* (including *Gnetaceæ*), *Umbellifloræ*, *Amentifloræ*, *Passiflorales* (culminating in *Campanulaceæ* and *Compositæ*), *Centrospermæ*, *Caprifoliales*, and *Tubifloræ*, the last, descendants of *Sterculiaceæ* and divided into two groups —*Contortæ* (*Apocynaceæ*, including *Asclepiadaceæ*, *Loganiaceæ*, and *Rubiaceæ*) and *Tubifloræ* in the usual sense, excluding *Convolvulaceæ*.

While there is much that is suggestive in Dr. Hallier's system, one cannot but feel that he has not always viewed affinities in their due proportions. For instance, noting the familiar orders among the twenty-six included in the cohort *Passiflorales*, we find in sequence *Violaceæ*, *Cistaceæ*, *Passifloraceæ*, *Onagraceæ*, *Haloragеæ*, *Balsaminaceæ*, *Gentianaceæ*, *Aristolochiaceæ*, *Rafflesiaceæ*, *Loasaceæ*, *Begoniaceæ*, *Cucurbitaceæ*, *Campanulaceæ*, and *Compositæ*. The inclusion of *Violaceæ* and *Balsaminaceæ* (including *Parnassia*) in the series which contains also *Compositæ* suggests a view of affinities which it is difficult to follow, and one wonders how such a series will be diagnosed. Again, the removal of *Convolvulaceæ* from the neighbourhood of *Polemoniaceæ*, *Hydrophyllaceæ*, *Solanaceæ*, and *Boraginaceæ*, all of which are members of the last cohort, *Tubifloræ*, to an early position in the scheme under *Ebenales* requires, we think, more justification than has hitherto been given. Of his cohort *Rosales*, which contains thirty-five orders, the author remarks that it will probably be divided into several after a more exhaustive examination.

The criticism suggests itself that the author would have done a still more helpful thing towards furthering the progress of phylogenetic botany if he had deferred the publication of his scheme until he had been able to make a fuller examination of available material, and could give a diagnosis of the cohorts and orders.

NEW RUBIACEÆ FROM BRITISH EAST AFRICA.

By Spencer le M. Moore, F.L.S.

(Concluded from p. 251.)

The whole of Kaessner's *Rubiaceæ* have now been examined; the following seem worthy of notice:—

Oldenlandia decumbens Hiern in Fl. Trop. Afr. iii. 54.—Hab. Pemba River. No. 364.

O. capensis Linn. fil. Suppl. Pl. 127.—Hab. Samburu. No. 487.

O. Wiedemannii K. Schum. in Engl. Bot, Jahrb. xxviii. 57 (*Wiedenmannii*) (e descript.).—Hab. Sultan Hamoud. No. 653.

Agrees exactly with Schumann's description, except that the leaves are still narrower (only 0·15 cm. broad), and the corollas and

styles a trifle shorter (0·3 cm. instead of 0·4 cm.). A very distinct species, which one would naturally sort into *Spermacoce* before examination.

Oldenlandia prolixipes, sp. nov. Herba ramosa ramis patentibus bene foliosis novellis pubescentibus, foliis parvis sessilibus oblongo- vel lineari-lanceolatis acutis basi obtusis scabriuscule puberulis 1-nervibus in sicco griseo-viridibus, stipulis brevibus truncatis paucisetosis, floribus submediocribus 4-meris pedunculo elongato pseudoterminali fultis in cymis laxis 2–3-floris dispositis, pedicellis calycem multoties excedentibus ut pedunculus glabris, calycis glabri tubo (ovario) subsphæroideo quam limbus alte in lobos lanceolatos breviter acuminatos partitus paullulum breviore, corollæ calycem duplo excedentis lobis tubum æquantibus, antheris inclusis, stylo incluso, stigmatis ramis stylo æquilongis linearioblongis cerebro papillosis.

Hab. Near Avisana, at 400 ft. No. 442.

Folia ± 1·5 cm. × 0·3–0·4 cm., margine levissime revolutæ. Stipulæ circa 0·2 cm. long. Pedunculi summum 4·5 cm. long., breviores vero exstant. Pedicelli 0·5–2·0 cm. long. Calyx totus 0·35 cm. long., cujus limbus 0·2 cm. metitur. Corollæ glabræ in toto 0·8 cm. long. Antheræ juxta medium tubum insertæ, 0·12 cm. long. Stigmatis rami 0·1 cm. long.

Near *O. abyssinica* Hiern, from which it differs in the hairiness of stem and leaf, the long pedicels, lanceolate calyx-lobes, &c.

Tarenna angolensis Hiern in Fl. Trop. Afr. iii. 89.—Hab. Timba. No. 246.

Apparently the same as the type collected in Angola by Monteiro.

Gardenia Annæ P. Wright in Trans. Roy. Irish Acad. xxiv. 375, var. *Moramballæ* Hiern in Fl. Trop. Afr. iii. 103. — Hab. Makvui. No. 405.

Polysphæria multiflora Hiern in Fl. Trop. Afr. iii. 127. — Hab. Near Moa, and on high ground, Pemba River. Nos. 57 and 362.

P. parvifolia Hiern in Fl. Trop. Afr. iii. 128.—Hab. Pemba Mt., at 400 ft. No. 387.

Canthium Kaessneri, sp. nov. Inerme ramis maxime divaricatis, ramulis bene foliosis glabris, foliis parvis brevipetiolatis oblongo-oblanceolatis obtusissimis basin versus sensim angustatis coriaceis glaberrimis supra nitescentibus costis secundariis utrinque 3–4 ascendentibus, stipulis parvis lanceolatis acuminatis mox evanidis, floribus mediocribus pseudumbellatis conspicue pedicellatis inflorescentiis ramulos coronantibus sessilibus vel brevissime pedunculatis plurifloris, calycis glabri limbo brevissimo undulatotruncato, corollæ tubo sat lato extus glabro intus annulo pilorum instructo limbo 5-lobo lobis lanceolatis acutiusculis quam tubus paullo longioribus, antheris exsertis oblongo-ovatis obtusis quam filamenta paullulum longioribus, disco perspicuo, stylo glabro corollæ tubum parum excedente stigmate calyptriformi apice bifido longitrorsum rugato.

Hab. Gadu, at 300 ft. No. 418.

Folia 4·0–5·0 × 1·7–2·3 cm.; petioli summum 0·5 cm. long., glaberrimi. Stipulæ circa 0·3 cm. long. Pedicelli 0·5 cm. long. Calycis tubus (ovarium) subsphæroideus, 0·12 cm. long., limbus 0·05 cm. Corollæ tubus 0·5 cm. long., 0·22 cm. lat.; limbus 0·6 cm. long. Filamenta ægre 0·2 cm., antheræ 0·22–0·26 cm. long. Stylus carnosulus, 0·7 cm. long., stigma 0·2 cm.

This has much the look of *C. Schimperianum* A. Rich., from which it can easily be told on first view by the much larger flowers with a broad tube.

Canthium pseudoverticillatum, sp. nov. Inerme ramulis gracilibus bene foliosis ramulos sæpissime brevissimos gignantibus qui basi pilis longis fulvis cinguntur, foliis parvis breviter petiolatis sæpe ex ramulos perbreves oriundis igitur equidem pseudoverticillatis lanceolatis vel oblanceolato-oblongis acutis vel debiliter unguiculatis basi cuneatis glabris membranaceis nequaquam nitidis costis secundariis utrinque 3–4 parum arcuatis in sicco sæpe aliquanto nigrescentibus, stipulis e basi lata extus strigose pubescente subito in setam glabram exeuntibus, inflorescentiis axillaribus paucifloris subsessilibus, floribus parvulis plane pedicellatis 5-meris, calycis tubo (ovario) ovoideo glabro limbum brevem 5-denticulatum excedente, corollæ extus glabræ tubo brevissimo sc. quam limbus duplo breviore intus annulatim hirsuto, antheris subsessilibus breviter exsertis oblongo-ovatis obtusiusculis, stylo corollæ tubo paullulum longiore glabro, stigmate calyptriformi bifido.

Hab. Schimba Mt., at 1500 ft., and Gadu. Nos. 383 and 416.

Folia 2·5–3·0 cm. × 0·8–1·4 cm., subtus sæpe in sicco castaneo-brunnea ibique semper pallidiora et in axillis raro fulvo-barbellata; costulæ aperte reticulatæ, fac. sup. haud aspectabiles. Pedunculi summum 0·2 cm. long. Calycis tubus 0·15 cm., limbus 0·04 cm. long. Corolla 0·3 cm. long; tubus modo 0·1 cm. long; limbi lobi ovato-oblongi, obtusi. Antheræ 0·15 cm. long. Stylus 0·12 cm., stigma 0·08 cm. long.

Known by the small, often pseudoverticillate leaves often drying dark or chestnut-coloured, coupled with the small flowers in sessile clusters, and the structure of the parts of these latter. The tufts of hairs at the base of the branchlets are also distinctive.

Canthium pubipes, sp. nov. Inerme ramulis sat tenuibus deorsum nudis ultimis abbreviatis glabris, foliis parvis brevipetiolatis lanceolatis vel anguste lanceolato-ovatis obtusis interdum cuspidatis basi angustatis papyraceis glaberrimis costis secundariis utrinque circa 5 valde arcuatis additis paucis apicem versus parum perspicuis, stipulis inconspicuis e basi lata breviter acuminatis, inflorescentiis ramulos ultimos terminantibus paucifloris manifeste pedunculatis pedunculo minute griseo-pubescente, floribus parvulis brevissime pedicellatis tetrameris, calycis tubo (ovario) turbinato-ovoideo glabro quam limbus undulato-truncatus duplo longiore, corollæ parvulæ extus glabræ tubo limbum paullo excedente faucibus pilosis limbi lobis oblongis vel anguste oblongo-ovatis acutiusculis, filamentis brevissimis antheris parvis subinclusis, stylo corollæ tubum superante superne obscure papilloso, stigmate mitriformi bilobo.

Hab. Pemba Flats. No. 393.

Folia 3·0–4·0 cm. long., 1·2–2·0 cm. lat., in sicco grisea vel griseo-olivacea, subtus pallidiora ibique in axillis nervorum raro pilorum alborum pulvillo induta; venulæ laxe reticulatæ, pag. sup. vix aspectabiles. Stipulæ summum 0·2 cm. long. Pedunculi 0·7–0·8 cm. long., pedicelli circa 0·05 cm. Calyx totus 0·15 cm. long., cujus limbus 0·05 cm. Corolla 0·5 cm., tubus 0·3 cm. long. Antheræ oblongæ, obtusæ, 0·07 cm. long. Stylus 0·4 cm., stigma 0·1 cm. long., hoc papillosum.

Known by the small papery grey-green glabrous leaves, the terminal inflorescences on a relatively long pubescent peduncle, the small flowers with truncate calyx, the corolla with tube slightly longer than limb, &c.

Pavetta tarennoides, sp. nov. Ramulis gracilibus aliquanto complanatis glaberrimis, foliis pro rata mediocribus petiolatis ellipticis apicem versus coartatis obtusis basi acutiusculis papyraceis glaberrimis pallidissime nitidis costis secundariis utrinque 6–7 parum perspicuis valde arcuatis, stipulis e basi lata extus glaberrima intus pilis sordide albis dense vestita in appendicem setiformam se ipsam excedentem glaberrimam exeuntibus diuscule persistentibus, corymbo terminali abbreviato (sc. a foliis facile superato) sublaxe plurifloro glabro, floribus pedicellatis tetrameris, calycis glabri tubo (ovario) anguste turbinato quam limbus alte lobatus breviore, corollæ mediocris glabri tubo attenuato limbum æquante, antheris breviter exsertis tortis, styli parte exserta corollæ tubum $2\frac{1}{2}$-plo superante glabro, stigmate anguste clavellato integro.

Hab. Mele. No. 230.

Folia 10·0–14·0 cm. long., juxta medium 3·0–4·5 cm. lat., costulæ obscuræ, arcte reticulatæ; petioli tenues, glaberrimi, ± 1·0 cm. long. Stipularum basis 0·2–0·25 cm., appendix 0·6–0·8 cm. long. Corymbus 5·0 cm. long., 3·5 cm. diam. Pedicelli adusque 1·0 cm. long., sæpissime vero breviores. Flores verisimiliter albi. Ovarium 0·15 cm., calycis limbus 0·35 cm. long., hujus lobi subulati. Corolla 2·0 cm. long.; limbi lobi lanceolato-oblongi, acuti. Antheræ 0·6 cm., stylus 3·7 cm. long.

Recognized by the medium-sized papery glabrous leaves, the persistent stipules villous inside, the terminal short and rather lax corymb, and floral details as given above.

Psychotria amboniana K. Schum. in Engl. Pflanzenw. Ost-Afr. C. 390.—Hab. Schimba Mt. and Bome River. Nos. 185 and 307.

The Bome River plant is a form with narrow leaves—only 0·5 cm. in average breadth.

Tardavel Kaessneri S. Moore in Journ. Bot. *ante*, p. 250. An additional locality for this is Mele. Nos. 227 and 228.

NOTES ON THE BRITISH KŒLERIAS.

By G. Claridge Druce, M.A., F.L.S.

Under the title "Fragmente zu einer Monographie der Gattung *Kœleria*" Dr. Karl Domin has published in the *Ungarische Bot. Blätter*, Jahrgang iii. 1904, Nos. 6–12, an excellent account of the genus *Kœleria*, which is to form the basis of a future monograph. From a very rich collection of material the author is convinced that some groups of forms, and especially in the case of the extremely variable group of *Cristatæ*, acquire a special variability in different countries; if one noted every divergence from type, it would be necessary to recognize hundreds of varieties of different degrees. He explains this extreme tendency to variability by suggesting that most Kœlerias are still very actively developing. They are quite modern types, and include certainly several good species, which, however, are not yet sufficiently fixed; this is especially true of the numerous territorial forms which appear, and are often represented as good species, but (particularly where the two territorial species of one and the same type meet) are not infrequently united by intermediate forms. Moreover, species which are not inter-related, or only so by distant steps, are united by forms almost intermediate in character, which must be regarded as an extreme variation of one or the other. If we are not disposed to count such forms as transitional, but only to accept them on the score of an extensive variability, the consideration cannot be evaded that all species of the section *Airochloa* clearly point to a common descent from one original type, a suitable name for which would be the old *K. cristata* Pers., the *Aira cristata* of Linnæus. There is often a further difficulty in the way of determination by diagnosis. A species fixed by several leading characters is of course always easy to recognize when it retains its characteristic facies, but exceedingly difficult to diagnose when one or another of the leading characters disappears, though the other leading points experience no change. Thus sometimes there would be hardly any fixed point useful for every case, for determining a form. Associated with this is often the circumstance that many species, after flowering, imitate other forms in colour, convolution, and hairiness of leaves.

I have abstracted from Dr. Domin's memoir such information bearing upon our British forms (some of which he has not met with elsewhere) as is likely to be useful to readers of this Journal who may not have access to the original paper. I have also to thank Dr. Domin for hitherto unpublished information, which I have incorporated in these remarks.

Kœleria splendens Druce (*K. vallesiana* Aschers. & Graebn.) was sufficiently described in the last number of this Journal. Dr. Domin says that the variations of this species are not extensive, and hardly justify the establishment of "varieties." Specially variable is the clothing of stem and glumes; but, though these differences are so extreme that they affect the external habit of the whole plant, there are numberless intermediate forms, some-

times even on one and the same example and often in the same locality, as mentioned by Hackel and Ascherson among others.

K. GLAUCA DC. Hort. Monsp. 116 (1813). Subsp. K. ARENARIA Dumort. Agrost. Belg. 115 (1823) (*K. albescens* DC. var. *glabra* DC., Domin *in lit.*).

Laxe cæspitosa multiculmis minus glauca, humilior sæpius solum 10–20 cm. alta, rhizomate interdum prorepenti, foliis radicalibus numerosis angustis convolutis brevibus (3–6 cm.) rigidis glaberrimis sæpe curvatis, vaginis infimis pallidis, folio culmeo plerumque unico, lamina brevi recta 1–2 cm. longa, vaginis typice puberulis, culmis glabris haud raro totis pubescentibus, panicula densa contracta pro more haud interrupta circa 3–5 cm. longa, spiculis minoribus solum 4–4·5 mm. longis, glumella obtusiuscula interdum quoque acutata.

It occurs, although rarely, on maritime sands in Northern and Western France, as at Cherbourg, and is said to be frequent in the islands of Borkum, Juist, Romö, &c., on the south and west coast of Friesland. In Britain it has been found on the Chesil Beach, Dorset (*J. W. White, in hb. Druce*); in Fifeshire (*C. Bailey*); Findhorn, Elgin; Tain, East Ross; Golspie Links, East Sutherland.

Of this an interesting and hitherto undescribed hybrid is

× K. SUPRAARENARIA (*K. arenaria* × *gracilis*) Domin *in lit.*

"Statura humili vix 2 dm. alta densius cæspitosa, foliis basilaribus numerosis abbreviatis plurimis curvatis rigidis obscure viridibus setaceo-convolutis paucis planis intermixtis disperse hirsutis, vaginis breviter villosulis suprema interdum glabrescenti, foliis culmis paucis laminis brevibus vaginis multo brevioribus instructis, culmis villosulis vel glabrescentibus, panicula breviora cylindrica inferne interdum subglobata sed densa, spiculis bifloris c. $3\frac{1}{2}$–4 mm. longis, glumis glumellisque pro more coloratis, glumis acuminatis ± villosulis usque villosis, glumellis in aristulam brevem protractis. Habitu humili, foliis panicula densa ac *K. arenaria* optime congrua, sed differt indumento, spiculis coloratis, præcipue autem glumis acuminatis, glumellis aristulatis."

This is the plant which was sent to the Exchange Club in 1888 by Mr. J. E. Griffith under the name *K. cristata* c. *arenaria* Lej., from Trefadog, Anglesey; and from the beach near Llanfaglan coast, near Bangor, in 1892, under the name as corrected by Prof. Hackel of *K. cristata* f. *humilis*. I have it also from the Anglesey coast, and to this may probably also be referred a specimen gathered by the late Mr. F. T. Richards from the Lizard coast.

Subsp. K. ALBESCENS DC. Hort. Monsp. 117 (1813).

Rhizomatibus laxe cæspitosis tenuibus vaginis siccis pallidus (interdum et senio vix in fila salutis) ut in *K. arenaria* longe culmum involucrantibus, vaginis foliorum infimorum sæpe albo-puberulis mediis sæpe glabrescentibus suprema interdum glabra, laminis longioribus angustis convolutis vix curvatis rigidis glaucis glabris vel puberulis iis foliorum culmorum magis evolutis, culmis sat robustis elatis (usque 6 dm.) ad apicem sæpe puberulis, panicula densa pro more contracta inferne interrupta parum lobata, spiculis

interdum majoribus 4–6 mm. longis, glumis acutis, glumella plerumque acutiuscula interdum subobtusa.

This is found in the litoral sandy tracts of Northern Spain and Western France (in the Departments of the Landes, Vendée, and the Gironde), and should occur on the Devonshire, Cornish, or South-west Irish coasts. My specimens from the Quenvais, Jersey, in 1878, Domin labels "*K. albescens* DC. vera."

K. GRACILIS Pers. Syn. i. 97 (1805).

"Dense cæspitosa, vaginis vetustis indivisis pallidis ± glauca (præcipue formæ glabrescentes sæpe conspicue glauco virescentes), humilis vel elata, culmis gracilibus pro more etiam sub panicula glabris, foliis sæpe brevioribus rigidiusculis vaginis ± molliter pilosis rarissime glabris, laminis angustis sæpe convolutis vix plus 2 mm. latis sæpe in facie pubescentibus, ligulis brevibus sæpe exauriculatis, panicula rarissime dense cylindrica sæpius inferne subdilatata interruptaque pallida nitenti ramis ramulisque tenuibus, spiculis angustioribus lanceolatis bifloris minutis solum 3–5 mm. longis."

K. gracilis may be distinguished from forms of *K. ciliata* by the vegetative parts. Although usually taller, it is never so robust; its leaves are finer, more closely convolute, or, if broader and flat, they are either grey-green and stiff, with prominent nervature, or have more matted pubescence. Its early flowering period is also an important feature; when *K. ciliata* is well developed *K. gracilis* is already dry. It is to be remembered that quite typical *K. gracilis* puts out stiffer, shorter, more strongly grey-green, completely flat, and quite glabrous summer leaves, so that such forms are very deceptive.

This is common and widely distributed in Britain. A hydrophytic form (var. *latifolia* Domin in Herb. Mus. Brit.) is in the National Herbarium (ex Herb. Sowerby): I have it from among hay at Kew (*G. Nicholson*). Of the var. *gypsæa* Domin, only recorded from Nordhausen in the monograph, I have a specimen authenticated by Dr. Domin from Durdham Downs, W. Gloucester.

The most interesting plant is, however, the one which we in Britain have been calling *K. cristata*. Dr. Domin says that, although a very large mass of material from various localities has been under his observation, he has seen nothing identical with this plant. On some sheets in the National Herbarium Dr. Domin marked it as subspecies *villosula*; but from the wider range of which I have been able to send him, he now thinks it to be a good geographical subspecies, for which he suggests the more appropriate name **K. britannica.** This he diagnoses as follows:—

"Pro more laxiuscule cæspitosa rhizomatibus sæpe prorepentibus vel tenuibus vaginis siccis pallidis longe involucratis, culmi humilioribus vel altioribus totis ± pubescentibus (mox præcipue sub panicula, manifeste villosulis, mox tantum brevissime tenuiter puberulis), foliis brevioribus vel longioribus semper angustis planis usque setaceo-convolutis ± molliter hirsutis nunquam rigidis, vaginis dense molliter pubescentibus culmum laxe ambientibus vel subpatentibus suprema pro more minus dense et breviter vestita

subinflata, panicula ± lobata, spiculis bifloris rarissime trifloris c. 4 mm. longis pubescentibus puberulisve raro fere glabris, glumis sæpius acutis (nec acuminatis), glumellis haud raro aristulatis, flosculis e glumellis parum excedentibus."

I have it in my herbarium from Ballater, S. Aberdeen; Findhorn, Elgin; Sands of Barry; near Arbroath, Forfar; Boat of Garten, Easterness; Arthur's Seat, Edinburgh; Stow Wood, Oxon; Lydd, New Romney, Kent; near the Lizard, Cornwall. I have seen specimens named by Dr. Domin from Seaton Carew, Durham (*Lawson in Hb. Oxon*), and (in the National Herbarium) from Invercauld (*A. Croall*), Orkneys (*E. S. Marshall*), and Isle of Man (*G. Holt*). Dr. Domin says that this plant is highly critical, its systematic position causing great difficulty on account of the great variability of most of the examples. It often vividly recalls *K. albescens*, but otherwise by a series of forms is united with *gracilis*. This is well shown in my series from Lydd Shingle. It is not impossible that it frequently appears as a hybrid (*gracilis* × *albescens*).

K. gracilis in England is found by preference on dry, hilly, chalky, or calcareous ground, meadows, etc.; *K. albescens* and *K. arenaria* (which belongs to it) on the whole is a plant of sea dunes or in general of sandy wastes. *K. britannica* shares the habitat of the latter species, but is also found on the rocky pastures of Arthur's Seat, the inland calcareous pastures of Oxfordshire, etc.; in the majority of cases cannot be separated from *K. gracilis*, and frequently might well represent a mingling of both,

Dr. Domin says that as a whole the British *Kæleriæ* are very critical, and some forms occur which he has not met with in his investigation of a very large amount of material from all parts of the globe.

PLANTS OF PEMBROKESHIRE (v.-c. 45).

By E. F. Linton, M.A.

There have been three papers in the last twenty-one years in this Journal (1884, 43; 1901, 52; 1903, 245) dealing with the Flora of N.W. Pembrokeshire, and more particularly with the neighbourhood of St. David's, and yet the botany of the district does not seem at all exhausted. I stayed there eleven days last August, enjoying the hospitality of the Dean of St. David's, and found numerous plants not previously reported, including a few (chiefly Rubi) not recorded for the county. Most of the species referred to in the preceding papers came under my notice, but I have avoided repeating them except to give further localities for those that were of unfrequent occurrence. Of the places mentioned in this list, Haverfordwest (the nearest railway station) is sixteen miles, Fishguard and Goodwick seventeen miles, and Newgale eight miles away; the remainder are within three or four miles of St. David's. An asterisk is prefixed to reputed county records.

Caltha palustris L. Treleddyd Common; scarce.

Fumaria Boræi Jord., between type and var. *ambigua* Pugsley. Porth Lisky. Mr. Pugsley confirms this naming.—*F. confusa* Jord. Porth Lisky; near Dowrog Marsh.

Cheiranthus Cheiri L. Ruins of Bishop's Palace, St. David's; Solva.—*Coronopus Ruellii* All. Newgale.

Reseda Luteola L. Frequent.

Viola arvensis Murr. A neat compact form occurred at Porth Clais, and on cliffs south of St. David's, where gorse had been burnt.

Polygala oxyptera Reichb. Cliffs south of St. David's.

Silene Cucubalus Wibel. — *S. maritima* With. Unusually abundant on cliffs and field-walls near the sea.—*S. anglica* L.—*Lychnis dioica* L. — *Cerastium tetrandrum* Curtis. St. David's Head.—*Stellaria graminea* L. Croesgoch, &c. — *Spergula arvensis* L. a. *vulgaris* (Bœnn.). Goodwick; Whitesand Bay.—*Montia fontana* L.

Hypericum humifusum L. Near St. David's; Porth Clais.

Malva rotundifolia L. Roadside, St. David's.

Geranium pratense L. Croesgoch. — *G. pusillum* L. and *G. dissectum* L. Whitesand Bay.—*Erodium maritimum* L'Hérit. Porth Clais; very fine where gorse had been burnt, top of cliff, south of St. David's.

**Acer campestre* L. Near the town, but seemingly native.

Cytisus scoparius Link. Goodwick.—*Trifolium scabrum* L. Whitesand Bay.—*T. hybridum* L. St. David's; Haverfordwest.

Lotus corniculatus L.—*L. uliginosus* Schkuhr.—*Vicia Cracca* L. Toward Porth Clais; uncommon. — *Lathyrus pratensis* L. Croesgoch.

Prunus Cerasus L. Near Haverfordwest. — *Rubus cariensis* Rip. & Genev. The Burrows.—The following brambles have not to the best of my belief been published for the county:—**R. argenteus* W. & N.—**R. Selmeri* Lindeb. Porth Clais.—**R. Godroni* Lec. & Lam. (*R. argentatus* P. J. Muell.), "a glabrescent coast form," W. M. Rogers; The Burrows.— **R. thyrsoideus* Wimm. sp. collect. Identical with a form Mr. Rogers gathered on the Lizard Peninsula in 1904, and so named; two or three localities near St. David's—**R. hypoleucus* Lef. & Muell. (*R. adscitus* Genev.). The Burrows.—**R. pyramidalis* Kalt. Also towards Whitesand Bay. — **R. scaber* W. & N. Between St. David's and Whitesand Bay.—I am indebted to the Rev. W. M. Rogers for assistance with these Rubi.

Potentilla silvestris Neck. — *P. procumbens* Sibth. Newgale; Solva.—*P. reptans* L. — *Agrimonia Eupatoria* L. Frequent.—*Rosæ* were remarkable by their absence; I saw only *R. spinosissima* L. and *R. tomentosa* Sm. — *Cotoneaster microphylla* Wall. Ruined wall in the Palace grounds; bird-sown no doubt here as in Glamorgan (p. 244); or on a railway bank near Spetisbury, Dorset; or on a rocky roadside between Blairgowrie and the Spittal of Glen Shee, where it occurred far from habitation. The Palace, long ago destroyed by fire, contains no trace of cultivation.

Ribes Grossularia L. Porth Clais.

Sedum Telephium L. Roadside hedge near Solva.—*S. acre* L. Goodwick.

Drosera rotundifolia L. Dowrog.

Epilobium hirsutum L. Streams and ditches here and there.

Circæa lutetiana L.

Hydrocotyle vulgaris L. Whitesand Bay.—*Carum Petroselinum* Benth. & Hook. fil. Solva; Porth Clais.—*Pimpinella Saxifraga* L.; the form I take to be var. *dissecta* With. Occasionally.—*Scandix Pecten-Veneris* L.—*Œnanthe Lachenalii* C. Gmel. Goodwick.—*Angelica silvestris* L. Croesgoch.

Galium verum L. and *G. palustre* L. Goodwick.

Aster Tripolium L. Goodwick.—*Filago germanica* L.—*Achillea Ptarmica* L.—*Petasites fragrans* Presl. Near Port y Rhaw.—*Senecio sylvaticus* L.—*S. aquaticus* L. Goodwick.—*Carlina vulgaris* L. Caer Fais.—*Carduus nutans* L.—*Cichorium Intybus* L. Porth Clais; Caer Bwdy.—*Hieracium Pilosella* L. Seen only on a wall by the Cathedral.—*Leontodon autumnalis* L. St. David's Head.

Campanula rotundifolia L. Croesgoch. Seems strangely scarce.

Armeria maritima Willd. Scarcely mentioned in previous papers, but very abundant, especially on field-walls near the cliffs.

Glaux maritima L. Goodwick. No suitable locality near St. David's.—*Anagallis arvensis* L. Waun Fawr. Remarkably scarce.

Ligustrum vulgare L. Mathry; on the edge of the cliff, Porth Sele. Not common.

Borago officinalis L. Still on waste ground about St. David's.—*Myosotis repens* G. Don. Whitesand Bay.—*M. arvensis* Lam. St. David's; Porth Clais.—*Echium vulgare* L. Dowrog.

Volvulus sepium L. Only once noticed.

Solanum Dulcamara L. Fishguard. Absent about St. David's?.

Linaria Cymbalaria Mill. Goodwick.—*L. vulgaris* Mill.—*Antirrhinum Orontium* L. Near the Dowrog.—*Scrophularia nodosa* L.—*Veronica polita* Fr.—*V. agrestis* L.—*V. Tournefortii* C. Gmel. By Dowrog Marsh; Porth Stinian.—*V. Chamædrys* L.—*V. scutellata* L. Trefeithan Pwll.—*V. Beccabunga* L. Goodwick.—*Euphrasia:* A better district for this genus I have never met with, and probably research would be rewarded. The Rev. E. S. Marshall suggests *E. curta* var. *glabrescens* for several of my gatherings, and agrees to some others as *E. gracilis* Fr.

Verbena officinalis L. Unusually frequent, roadsides and waste ground.

Mentha rotundifolia L. Near Trefeithan Pwll.—*M. Piperita* L. Porth Stinian.—*M. sativa* L. Waste ground south-west of St. David's; very fine.—*M. Pulegium* L. Wet common by Treleddyd Farm; also still by the Dowrog, as reported by Mr. More.—*Lycopus europæus* L. Dowrog Common; Goodwick.—*Scutellaria minor* Huds. Trefeithan Pwll.—*Marrubium vulgare* L. Porth Stinian.—*Stachys arvensis* L. St. David's and Porth Clais. Was Mr. More's *S. annua*, near Whitesand Bay, a slip? The two names have sometimes been confused.—*Galeopsis Tetrahit* L. Haverfordwest; St. David's; Porth Clais.—*Lamium amplexicaule* L. Porth Clais.—*L. hybridum* Vill. Field near the Dowrog.

Plantago maritima L. St. David's Head; Porth Clais.—*P.*

Coronopus L. Frequent. — *Littorella juncea* Berg. Very fine at Trefeithan Pwll; Dowrog Marsh.

Chenopodium Bonus-Henricus L. On two sides of St. David's.—*Atriplex patula* L. var. *erecta* Huds. By Dowrog Common.

Polygonum Convolvulus L. Towards Whitesand Bay.—*P. aviculare* L. var. *arenastrum* (Bor.), and another more typical form. Goodwick. — *P. Hydropiper* L. Whitesand Bay.—*P. Persicaria* L. and *P. lapathifolium* L. — *P. amphibium* b. *terrestre* Leers. Near Whitesand Bay.—*Rumex conglomeratus* Murr. Goodwick.—*R. pulcher* L. Outskirts of St. David's.

Euphorbia exigua L. Porth Clais.

Humulus Lupulus L.—*Urtica urens* L.

Myrica Gale L. Goodwick. Unexpectedly scarce with so much moist moorland about.

**Salix viminalis* L. Haverfordwest. The species appears to be unrecorded for the county, though the Rev. W. R. Linton has noted one of its hybrids (1901, 54).

Juncus bufonius L. and *J. conglomeratus* L. Near Whitesand Bay. — *J. maritimus* Lam. Goodwick.—*J. lamprocarpus* Ehrh. Goodwick.

Sparganium ramosum Huds. I believe var. *microcarpum* Neuman, but did not take a specimen. — *S. simplex* Huds. Dowrog; Goodwick.

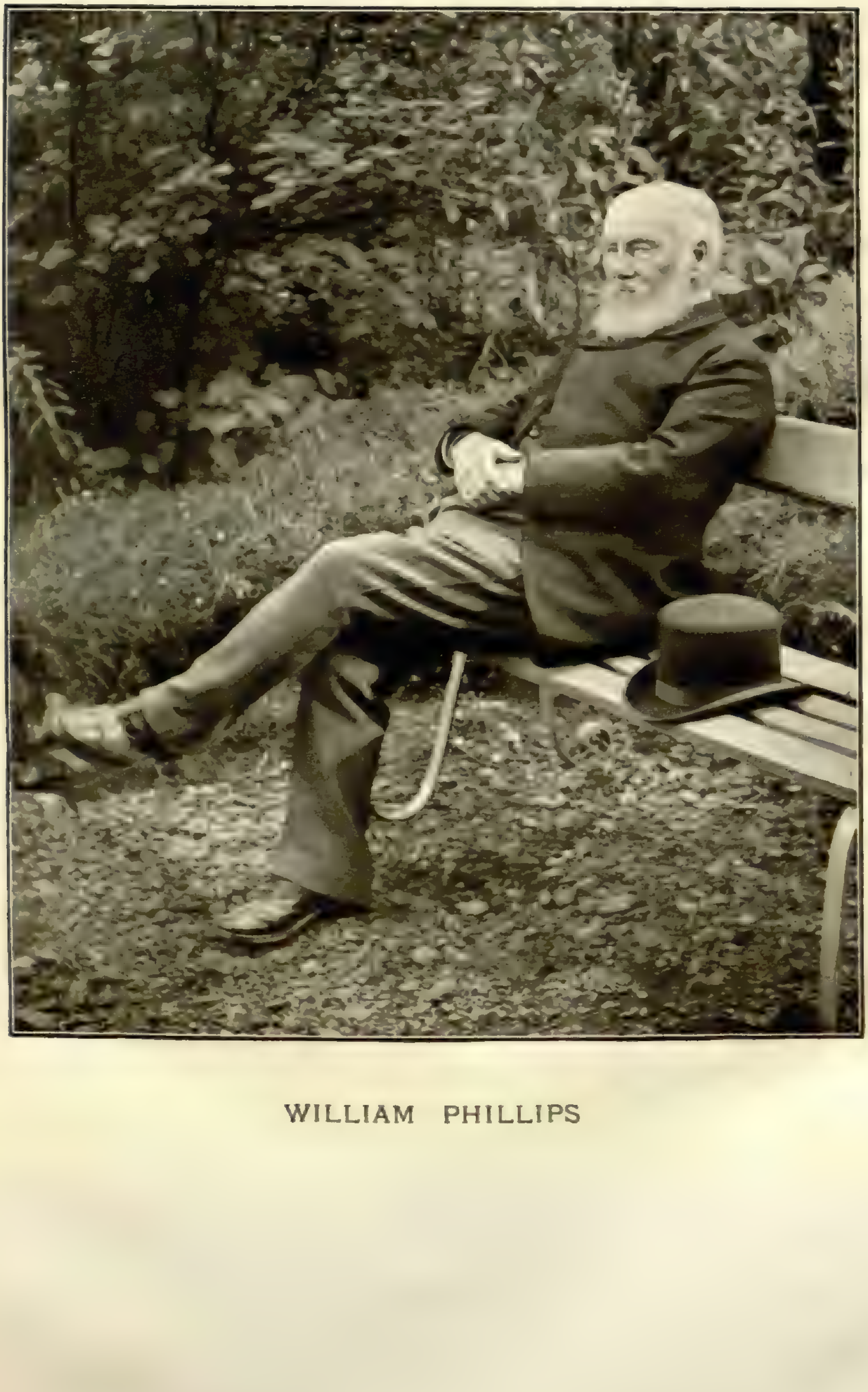
Alisma Plantago-aquatica L. Goodwick.—*A. ranunculoides* L. Goodwick.—Var. *repens* (Davies). Trefeithan Pwll; very abundant in a still-water conduit near where it leaves Dowrog Marsh on the north.

Triglochin palustre L. Whitesand Bay.—*T. maritimum* L. Goodwick.—*Potamogeton pusillus* L. Dowrog Marsh.—*Ruppia rostellata* Hartm. Goodwick.

Eleocharis palustris R. Br. Dowrog; Goodwick.—*E. multicaulis* Sm. Whitesand Bay; remarkably ergotized on Dowrog Common. —*Scirpus fluitans* L. Trefeithan Pwll. — *S. cernuus* Vahl. Port y Rhaw.—*S. setaceus* L. Whitesand Bay.—*S. Tabernæmontani* Gmel. Goodwick.—*Eriophorum angustifolium* Roth. Dowrog.—*Carex pulicaris* L. Dowrog.—*C. muricata* L.—*C. echinata* Murr. St. David's Head.—*C. flacca* Schreb. Dowrog. — *C. panicea* L. Waun Fawr. —*C. fulva* Good. Dowrog Marsh.—*C. Œderi* Retz. Porth Clais; Trefeithan Pwll.

Phalaris canariensis L. Goodwick. — *P. arundinacea* L. Caer Bwdy.—*Alopecurus geniculatus* L. Treleddyd Common.—*Phleum arenarium* L. Whitesand Bay. — *Ammophila arundinacea* Host. Whitesand Bay.—*Aira præcox* L.—*Phragmites communis* Trin. Goodwick.—*Festuca rigida* Kunth.—*F. rottbœllioides* Kunth. Newgale.—*F. rubra* L., probably f. *arenaria* (Osbeck). Whitesand Bay.—*Brachypodium gracile* Beauv. Porth Clais.—*Nardus stricta* L. Waun Fawr; near Whitesand Bay.

Lomaria spicant Desv. Croesgoch.—*Asplenium marinum* L. and *A. Ruta-muraria* L. Caer Bwdy. — *Athyrium Filix-fœmina* L. Croesgoch.—*Ceterach officinarum* Willd. Walls, Haverfordwest.—*Lastræa Filix-mas* Presl. Porth Clais. Curiously unfrequent.—*L.*



WILLIAM PHILLIPS

dilatata Presl. Croesgoch. In *Top. Bot.*, "Counties all except . . . 42 to 74" is no doubt a misprint for "42 to 44."

Equisetum maximum Lam. By the streamlet, Whitesand Bay.—*E. limosum* Sm. var. *fluviatile* (L.). Ditch, Dowrog Marsh.

Pilularia globulifera L. In fair quantity both in shallow margins of Trefeithan Pwll, and Waun Fawr.

The species for which no station is given were all found quite near St. David's.

WILLIAM PHILLIPS, F.L.S.
(1822–1905.)

(WITH PORTRAIT.)

By the death of William Phillips, at the age of eighty-three, another veteran has been removed from the ranks of British botanists. He was born at Presteigne, Radnorshire, on May 4, 1822, but went to Shrewsbury at the age of ten, where he subsequently joined his brothers in business. He took up botany in middle life, through association with the Rev. W. A. Leighton, devoting his attention at first to flowering plants as well as to fungi, on which latter he ultimately specialized. He contributed notes or reviews to most volumes of this Journal between 1871 and 1893, in which latter year he published a figure (drawn by himself) and description of *Gyromitra gigas*; his papers on fungi appeared for the most part in *Grevillea* between the years 1873 and 1891. In 1878 he published at Shrewsbury a 'Guide' to the botany of the neighbourhood, and in 1881 contributed to the *Transactions* of the Shropshire Archæological Society a paper on the Hymenomycetes of the county. He also published (1874–81) a set of specimens entitled "Elvellacei Britannici." In 1875 he became a Fellow of the Linnean Society.

Phillips's principal work, however, was the *Manual of the British Discomycetes*, which was published in 1887 in the International Scientific Series. This was accepted by mycologists as an important contribution to our knowledge, and as a careful summary of what was known of the group; it is illustrated by excellent plates from drawings by the author. During its preparation Phillips visited the National and Kew Herbaria and received help, both in the loan of specimens and in the communication of unpublished matter from Mr. Berkeley, Dr. Cooke, and Mr. Broome, with whom he was on terms of intimacy; his letters to Broome, from 1870 to 1885, are in the Broome correspondence which is preserved in the National Herbarium. One of his most interesting papers is that published in the *Transactions* of the Shropshire Archæological and Natural History Society in 1884 on "The Breaking of the Shropshire Meres," which he showed to be due to various algæ, which he figured and described; he treated the same subject in the *Midland Naturalist* for 1893.

In later life Phillips devoted himself more especially to antiquarian research, especially in connection with the history of the

Civil War in Shropshire; his work in elucidating local history was recognized by the conferring on him in 1903 the honorary freedom of the borough of Shrewsbury. *The Shrewsbury and Border Counties Advertizer*, in the accounts published on the occasion of his death, which took place on October 22, bears ample testimony to the respect and esteem with which he was regarded in Shrewsbury, and his funeral in the General Cemetery was attended by representatives of all the public bodies of the town and of various societies of which he was a member. We are indebted to the proprietors of the *Advertizer* for the use of the accompanying portrait, from a photograph taken not very long before his death, which appeared in the issue containing the account of the funeral.

THE REV. THOMAS ARTHUR PRESTON, F.L.S.
(1833–1905.)

Circumstances have prevented us from giving at an earlier date some account of the late Rev. T. A. Preston, whose death on Feb. 6 was briefly recorded on p. 104 of this Journal. Mr. Preston, who was born in Westminster, on Oct. 10, 1833, was educated at the City of London School, whence he went to Emmanuel College, Cambridge; he took his B.A. in 1856, and his M.A. in 1859; in 1857 he headed the first division in the Natural Science Tripos, with distinctions in botany and zoology. At Cambridge Preston was a pupil of Babington, with whom, as the *Memorials* of the latter show, he frequently corresponded in later life, chiefly in connection with the development of natural history studies at Marlborough College, with which his name and work will always be associated; here he was an assistant master from 1858 to 1873, and house-master from that year until 1885. In 1858 he was ordained a deacon, and in 1860 a priest, of the Church of England.

A good all-round naturalist, he at once began to interest the boys in the natural history of their district. With this object he published in 1863 a *Flora of Marlborough*, which he began to compile as soon as he took up work at the school; with characteristic modesty his name is omitted from the title-page, although it is appended to the preface. Of this a second edition was published in the Reports of the College Natural History Society for 1870–76. Of the Society it must suffice here to say that under Preston's initiation and direction it attained a high position, and was the cause of the establishment of similar organizations in other public schools. To the training imparted by Preston to his pupils we owe the excellent work done by Mr. Everard im Thurm in British Guiana, and by Mr. J. F. Duthie in India; while British botanists have cause to thank him for the zealous investigation of their flora by the Rev. E. S. Marshall.

Mr. Duthie sends us an appreciation of Preston and his work, which will be read with interest. "I have every good reason to remember and to hold in honour the memory of my old friend

T. A. Preston for the good work done by him at Marlborough College in the cause of natural science. In the days when I was there as a schoolboy—I left in 1863—the study of natural science was very little thought of as an educational subject, and the few boys whose tastes inclined them to take an interest in natural history were further handicapped by the active hostility of schoolboy public opinion. Preston was keenly interested in all branches of natural history, and the influence of his enthusiasm very soon had the effect of stimulating into action the latent tendencies of those boys who happened to come under that influence. The infection spread by degrees, not only among the boys but to the masters, many of whom took an active and practical interest in the movement. In 1864 the Marlborough College Natural History Society was started, and it has become an institution of the school. To Preston, who was really the founder of this Society, I owe all the pleasure I have derived from a life-long study of botany, the foundations of which were laid by him."

To Preston, too, was due the systematic and steady recording of phenological phenomena; his notes on the first leafing and flowering of Marlborough plants will be found in this Journal for 1865 and 1868, and, for a series of years, in the Reports of the College Natural History Society and the Quarterly Journal of the Meteorological Society. The College Museum was projected, arranged, and catalogued by Preston.

In 1885 Preston was presented to the living of Thurcaston, in Leicestershire, and here, with his two sisters, who had been with him at Marlborough, he resided until his death. His interest in natural history, and especially in botany, continued; he did much work in the Leicester Museum, the botanical section of which he rearranged; and, somewhat on the plan adopted by Henslow many years before, enlisted the boys and girls of his school in the work of recording "first appearances," offering a reward of a farthing for a satisfactory report. In 1888 the Wiltshire Archæological and Natural History Society published his *Flowering Plants of Wilts*, which was reviewed in this Journal for the same year (pp. 380–2); a noteworthy feature of this work was the indication of first and latest date and mean time of flowering—the result of his observations in the field. Towards the end of his life he was asked to undertake a second edition of the not very satisfactory *Flora of Leicestershire*. Mr. A. B. Jackson, his fellow-worker, in the paper on Leicestershire plants which he contributed to this Journal for 1904 (pp. 337–49), mentions a paper read by Preston before the Literary and Philosophical Society of Leicester in 1900, enumerating additions to the county flora, and refers to the herbarium of Leicestershire plants in the local museum as one of the most representative collections of its kind, "thanks chiefly to [Preston's] unremitting labour."

Preston's work was characterized by zeal, steadiness, modesty, and accuracy. He can hardly be placed in the first rank of critical botanists, but he was eminently safe, and, as the results of his work at Marlborough showed, a most stimulating and encouraging helper

of young naturalists. His friend Mr. Moyle Rogers writes: "I never knew a more thorough painstaking observer and chronicler of all he observed, his huge MS. folios [recording his phenological and meteorological observations] being a model of neatness and exactness." His modesty finds expression in the preface to his Wiltshire Flora—which he would not call by that name—"though I have done my best, it is still so far from what a Flora should be that I have adopted without regret the unpretentious title which it now bears—*The Flowering Plants of Wilts*." It was doubtless owing to this that he published but little, although occasional notes from his pen will be found in this Journal; the insistence on claims to "first records" which is occasionally manifested was entirely alien to his character; so long as the work was done, it did not matter to him who did it.

We have already alluded to his friendship with Babington: Sir Joseph Hooker also encouraged him and helped him in his work at Marlborough, and he was in constant correspondence with many British botanists.

A sympathetic account of Preston, especially in his relations to Marlborough, from the pen of Mr. F. E. Thompson, to whom we are indebted for its perusal, is published in *The Marlburian* for March 4. In it we find a characteristic anecdote: "At a meeting of the Wilts Archæological Society, the President, Sir John Lubbock, was entertained by Mr. Preston at the Green. During dinner Sir John remarked to his host, 'We hear of enthusiasts, but did you ever know a botanist who bought or leased a bit of land in order to preserve a plant from extinction?' Mr. Preston did not betray himself, but one of the company, directing Sir John with his eye towards his host, remarked, 'A bad shot.' Then it came out how a certain marsh at Oxford was threatened, and how, to secure it, Mr. Preston obtained a lease of it." The address presented to him when he left Marlborough, "couched in no exaggerated terms," spoke of "his wide and accurate knowledge, his inspiriting enthusiasm, his unsparing labour, his large-hearted munificence"; and Mr. Thompson sums up his character in the sentence: "He was a man of strong and simple Christian faith, a devoted brother, a fast friend, genuine as pure gold, and singularly modest."

SHORT NOTE.

Rubus Newbouldii Bab. — Through the courtesy of Prof. Marshall Ward and Mr. R. H. Lock, I have had an opportunity of examining for the second time (after an interval of, I think, nine or ten years) the packet of specimens in the Cambridge University Herbarium on which the late Prof. Babington founded his *Rubus Newbouldii*. I regret to say that this second examination fully confirms the misgiving to which I gave expression in 1900 (Handb. Brit. Rubi, p. 66): "I expect that this Loxley plant will prove to be *R. Drejeri*." The packet in question contains eight sheets representing four *Rubus* specimens, each specimen being on two sheets

(one for panicle and the other for stem). Six of the sheets (numbered 134, 169, and 173) contain only panicles and stem-pieces collected by Rev. W. W. Newbould at Loxley, near Sheffield, in 1846 and 1847. The two remaining sheets are labelled "2476. Near *R. Newbouldii*. Shapwick, Som. Aug. 1889. H. S. Thompson." Mr. Thompson's specimens are not in good condition; but I am now satisfied that they belong to *R. Drejeri* G. Jensen. It is, however, on Newbould's specimens that Babington founded his *R. Newbouldii*; and, of these six sheets, five belong to *R. Drejeri*, while the first *panicle* (collected in 1846 and numbered "134") is undoubtedly a strong example of my *echinatoides* var. of *R. radula*; though the *stem-pieces* (bearing the same number and date) must go, like all the 1847 material, to *R. Drejeri*. This was published in 1883 (Fl. Dan. xvii. t. 3023), while Babington's first suggestion of the name *R. Newbouldii* appeared in 1886 (Journ. Bot. p. 230), and his full description in the following year's Journal, pp. 20, 21. Unfortunately, the plant represented in No. 66 of the "Set of British Rubi" (1892–1897) as *R. Newbouldii* Bab. is certainly distinct from all the specimens bearing that name in the Cambridge Herbarium. It is, however, widely spread in the British Isles, as I have myself seen it from fourteen British and four Irish vice-counties, and have always given it that name. If it would be permissible to quote it in future as *R. Newbouldii* Rogers—as it would under the circumstances be certainly convenient—it might be founded on my description under that name in p. 66 of my *Handbook*. No one could regret the apparent necessity for some such change more than I do.—W. Moyle Rogers.

NOTICES OF BOOKS.

Biochemie der Pflanzen. By Friedrich Czapek, Ph.D., M.D., Professor of Botany at Prague. Vol. II. 8vo, pp. xii, 1027. Jena: Fischer. Price 25 Marks.

The second and concluding volume of Dr. Czapek's work follows rapidly on the first, which we noticed on p. 132 of the present volume of this Journal. The work is an exhaustive compendium of botany from a chemical standpoint, and invaluable as a book of reference. The present volume comprises chapters 28 to 66 of the whole work, and begins with a general discussion of the proteids found in plants, their physical properties, chemical composition and products of decomposition, proteolysis by enzyme action, and their subdivision into groups. The next three chapters contain an account of the proteids found in bacteria and fungi, the process of nitrification, and the assimilation of free nitrogen. The author then proceeds to the discussion (chapters 32 to 40) of the proteids in seeds and other plant-organs, including buds and shoots, pollen-grains, fruits and foliage-leaves, the absorption of nitrogen-compounds by roots, by leaves of insectivorous plants, and by mosses and algæ. Chapters

44 to 48, comprising more than a hundred pages, are a chemical study of the final products of nitrogenous metabolism. The chapter on oxygen-absorption (pp. 368–492) is a useful historical and general account of the chemical phase of respiration and the products of oxidation in plants. The following chapters (50–54) deal with the chemistry of colouring matters, glucosides, and non-nitrogenous products of metabolism in the form of resins, latex and other secretions. Then comes an account, occupying eleven chapters, of the mineral matter in bacteria, fungi, and the various parts of the higher plants. Finally, the author discusses irritability from its chemical aspect—the effect of various substances as stimulants or poisons, and their relation to different physiological processes. The work is in every sense a solid contribution to a somewhat neglected aspect of plant-study.

A. B. R.

Illustriertes Handwörterbuch der Botanik. Mit Unterstützung der Herren Dr. v. Hoehnel, Dr. v. Keissler, Dr. Schiffner, Dr. Wagner, Dr. Zahlbruckner, und unter Mitwirkung von Dr. O. Porsch, herausgegeben von C. M. Schneider. 8vo, pp. viii, 690, tt. 341. Leipzig: Engelmann. 1905. Price 16 Marks.

This profusely illustrated Glossary and Encyclopædia of Botany will be useful to English readers of German botanical works, as well as to German-speaking students. As the editor, who writes from the Department of Botany of the Vienna Hofmuseum, points out, to have made the volume exhaustive would have been seriously to hamper its use by enormously increasing its size and cost. The aim of those who shared the work has been to include those terms which appeal to the general botanical reader and student, omitting terms of a purely descriptive nature, such as will be found explained in any small handbook, and those which are chemical, physical or geological rather than botanical, as well as those relating to micro-technique in the narrower sense. Terms which have gone out of use are also neglected. Wherever practicable, reference is given to the author of the term and its place of origin, the definition being as nearly as possible that employed by its author, and often illustrated by figures borrowed from the original work. For instance, under *Statolithentheorie* is a useful *résumé* of the theory, occupying more than a page, and illustrated by two good figures borrowed from Haberlandt. A short description of *Mesophyll* is illustrated by a transverse section of a beech leaf (after Pax); an article of a little over two pages on leaf-arrangement by familiar diagrams from Sachs, Prantl, and Schwendener; while under *Sporocarp* are reproduced the well-known figures of *Salvinia*, *Marsilia*, and *Pilularia*, also from Sachs. Some of the illustrations are original, as, for instance, some good diagrams illustrating cymose inflorescences by one of the authors, Dr. Wagner.

On the whole, a very considerable amount of information has been brought together into a comparatively small space, while references to literature indicate where a more complete account is

to be found. The book, which is clearly printed on good paper, will be a useful addition to the library of the botanical teacher and of the more advanced student.

A. B. R.

BOOK-NOTES, NEWS, &c.

The opening meeting of the present session of the Linnean Society on November 2, which was largely attended, was entirely occupied by a long and rambling paper by the Rev. Professor Henslow on "Plant Ecology, interpreted by direct response to the Conditions of Life." Its scope will be best indicated by extracts from the slip provided by the author for the Fellows present, which we reprint textually:—

"Part I. Plant Geography and Plant Surveying (Phytotopography), comprising Records of the Fluctuating Distribution of Species within definite areas (Associations, &c.), the Result of Natural Selection. Definition.—The Struggle for Existence, and the Survival of the better adapted under the circumstances."

"Part II. Ecology proper, or the Physiology of Plant-Geography, implies—'The Study of the Vital Relations of Organisms to their Environment' (Tansley). These include the ORIGIN OF ADAPTIVE STRUCTURES (i.e. varietal, specific, and generic characters) by means of the Protoplasmic Response to 'The Direct Action of the Conditions of Life, leading to Definite Results, whereby New Subvarieties arise without the aid of Natural Selection' (Darwin)."

The paper bristled with controvertible points, philosophical as well as biological; but, owing to its undue prolongation, many of those who desired to discuss it were unable to do so. It seems to us that there is room for considerable improvement in the arrangement of the Society's meetings. Sometimes the exhibitions practically occupy the whole evening; at other meetings there are none. It should surely have been possible to secure some exhibits for the opening meeting, after an interval of four months had elapsed since the members had assembled. The Society was officially represented at the Vienna Congress, and many would have been interested in some account of the conclusions arrived at on questions of nomenclature. So many of the Fellows live out of town that it is even, we think, a question whether the meetings might not begin half an hour earlier: in any case it is certain that a paper which does not end until 9.30 cannot be adequately discussed in the short time which remains.

The new edition of Mr. B. D. Jackson's *Glossary of Botanic Terms* (Duckworth & Co.) shows a great extension of the first issue, published five years ago; the book now extends to 371 pages, as against 327 in the original, and the price is not unreasonably raised from 6s. to 7s. 6d. net. In the brief but cordial notice which we gave on its first appearance (Journ. Bot. 1900, 405) we anticipated for

the book the large circulation which it has obtained, and the present issue is sure of an equally hearty welcome. That it is thoroughly "up to date" may be gathered from the fact that the examination suggested on p. 335 will have no terrors for him (or her) who has mastered the contents of this volume; Mr. Clements's new ecological terms duly appear in the Supplement, of which indeed they form no small portion; the "special terms contrived for American conditions" are, however, not included, and "those who require to know the meaning of such compounds as 'Carex-Sieversia-Polygonum-coryphium,' with its vernacular equivalent, 'The Sedge smart-weed Alpine meadow formation' are referred to" Mr. Clements's book. This from the new preface, from which also we learn that "the total numbers included in this Glossary amount to about 16,000, that is, nearly three times as many as in any other previous work in the language."

We regret to announce the death of the Abbé Soulié, who was murdered by Tibetan fanatics at Ba-tang, on the River Di-chu, in the Chinese province of Sze-chuen, in the latter part of June. The deceased abbé was attached to the Catholic Mission at Yerka-lo, a town about fifty miles further south on the Tibetan-Chinese frontier. He was an enthusiastic botanist and collector. A set of his plants is in the Kew Herbarium, and has been utilized by Mr. Hemsley in the later portion of the *Index Floræ Sinensis*. The districts of Tachien-lu and Tongo-lo, and the principality of Kiala, were carefully explored by him in 1893, and the working out of the collection was begun by Franchet. The plants were carefully selected and prepared, and fruit-specimens are well represented. Mr. A. E. Pratt, Dr. A. Henry, and the Abbé Piccoli have also collected in the same area.

The lately-issued part (vol. xxiii. pt. 1) of the *Transactions of the Botanical Society of Edinburgh* contains an important memoir on "Freshwater Algæ from the Orkneys and Shetlands," by Messrs. W. and G. S. West; several new species are described, and there are two plates. The part also contains the interesting and suggestive address on "Herbaria and Biology," delivered by Prof. Trail in February as "retiring president"; and papers on the Hepaticæ of the Glenshee district, by Mr. William Young; on the Lichens of the South Orkneys, by Mr. O. V. Darbishire (with description and figure of a new species, *Placodium fruticulosum*); and on *Drosera Banksii*, by Dr. Morrison.

The *Twenty-first Annual Report of the Watson Botanical Exchange Club* has been issued by Mr. George Goode, who has succeeded Mr. Stuart Thompson as Hon. Secretary. We shall probably give extracts later. It may be well, however, to point out that Mr. Pugsley's note under *Scirpus triqueter* clearly belongs to the preceding species, *S. carinatus*.

An appendix (fascicle vii.) to the Set of British Hieracia sent out by the Messrs. Linton will shortly be issued. The price will be £1. Those desiring to subscribe should address Rev. W. R. Linton, Shirley Vicarage, Derby.

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CORRECTIONS.

P. 31, l. 10 from bottom, for "Whaldon" read "Wheldon."
P. 32, l. 21 from top, for "*Salicornis*" read "*Salicornia*."
P. 35, l. 16 from bottom, insert " before "erroneous."
P. 65, l. 17 from bottom, for "vires" read "viri."
P. 118, l. 6 from bottom, for "*Odontochisma*" read "*Odontoschisma*."
P. 188, l. 19 from bottom, for "*palmelloides*" read "*palmettoides*"; l. 25 from bottom, for "*Sterreocalyx*" read "*Sterrocalyx*."
P. 248, l. 4 from top, for "He" read "Here."
P. 274, l. 15 from top, for "*Vida*" read "*Viola*."
P. 280, l. 6 from top, for "1847" read "1848."
P. 301, l. 7 from top, after "Solander" insert ", and published by Aiton."
P. 311, l. 3 from bottom, for ""Mexico"?" read ""Mexico?""

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